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THE ADORING ANGELS

Edwin Howard Blashfield, — 1848, U. S.

SO many of the implements of modern life are plain, drab and utilitarian, that our little folks need pictures like THE ADORING ANGELS in Blashfield's NATIVITY, to foster and direct their instinctive love of ornament. The richness of flower and fabric and color, the curving lines of the wings, robes and hands of the kneeling figures are at once decorative and expressive of a reverence which children will readily feel, and of which our century stands peculiarly in need.

PARENTS AND THEIR PROBLEMS;

CHILD WELFARE IN HOME, SCHOOL, CHURCH AND STATE.

A LITTLE CHILD SHALL LEAD THEM

EDITED BY

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QUOTATIONS

"How did you come to us, baby dear?"
"God thought of *you*, and so I am here."
—*George McDonald.*

"Happy is that married couple who, before the first bloom of their newly married life has disappeared, must begin to make preparations to welcome a tiny stranger to their home. This arouses within them both novel anticipations, new and inexhaustible joys. And then, if in addition to reasonable health and moderate means, one by one there appears a large family of healthy boys and girls, the problem of married life is solved without time for heartaches or jealousies. The joys and experiences of the present are too many and varied to allow the mind to wander back to the days of courtship and honeymoon, conjuring up what might have been."—*C. S. Carr, M. D.*

"I have no patience with women who refuse to have children on the plea that the world is over-peopled and that it is cruelty to give life that, at the best, can only be a barren struggle. The world is not over-peopled, but badly peopled. A hundred hands stretch out for what only two can grasp, but that is our fault, not the earth's; she can feed us; she is equable to all; it is we who are not."—*Ida Tarbell.*

"How long shall countless baby lives brighten only for a moment our path along the strand of time and then disappear and be as if they were not? The infant death rate stares women in the face. On them must depend the success of any attempt to lower that rate—any step toward the emancipation of women that does not register itself in a lower infant mortality is a step backward. Every change in the home life or the working life of women must ultimately stand the test of the infant death rate. It is the crux of the whole movement for the economic independence and broader usefulness of women. Every woman, be she mother, confirmed spinster or school girl, just granted her work certificate, has her share of responsibility in determining the standard of health for women, who must always be the custodians of infant life. The question is no longer, 'Shall women work?' but, *'How* can we improve the conditions under which women work so that their health shall not suffer?' *'How can we so limit their hours of work that they shall have strength and time to care for their babies?'* We are no longer discussing, 'Shall women go to college?' but, 'How can we teach them to care for their babies?' *'Not more babies, but babies that live,'* is the watchword."—*The Delineator.*

"Infant mortality is the most sensitive index we possess of social welfare."—*Newsholme.*

"The principle of infant life preservation is one of the most urgent and pressing questions for the nation to grapple with. If the public conscience was thoroughly awakened to the importance of this question, public opinion would hold up to scorn a mother who lost her infant from any disease resulting from improper feeding."—*D. Hastings Young.*

"The law places the value of a human life at five thousand dollars. Not that anyone would be willing to sacrifice his life for that amount, but this represents, roughly, the economic value of an average life to the community. In estimating the actual wealth of the nation in terms of its vital energy it would be impossible, of course, to fix any material equivalent. At the same time, a comparison between these values and those of common, commercial experience, helps one to an appreciation of their supreme importance."—*B. B. Winchester.*

"Phillips Brooks, in his funeral oration on Lincoln, said:

" 'Even his physical conditions are not to be forgotten in making up his character, We make too little always of the physical; certainly we make too little of it here if we lose out of sight the strength and muscular activity, the power of doing and enduring, which the backwoods boy inherited from generations of hard-living ancestors, and appropriated for his own by a long discipline of bodily toil.'

"The two propositions evolved out of these declarations are:

"'That the average home is the backbone of every nation; and that physical strength, sustained by a sane and tender mind, make for the best.'"—*Madame Carroll Dane.*

"To breathe through the nose, and not through the mouth, and to breathe deep, is a physical attainment of the highest value to mother and child. Its lasting effect on the stomach and heart cannot be overestimated in worth."

PHYSICAL CARE

I

THE SIGNIFICANCE OF A SOUND PHYSIQUE

DUDLEY ALLEN SARGENT, M. D.
Director Hemenway Gymnasium, Harvard University, Cambridge, Mass.

JUVENAL'S dictum of "a sound mind in a sound body" is a brief description of a happy state in this world, but how few of us realize its practical significance. Our bodies, as they exist today, are the results of struggles and conflicts that have gone on through the ages, in which the ability to stand erect and to use the trunk and limbs in lifting, carrying, pushing, pulling, striking, walking, running, jumping, swimming, etc., have played a most important part in enabling man to maintain a footing in the world and to compete for existence with other species of the animal kingdom. Yet there is hardly one of these physical activities in which man has not been surpassed by some of the lower animals. Therefore if we would account for man's supremacy among animated creatures we must look for it in the superior development of his brain and the more intelligent use of his hands and fingers.

This fact has become so evident during the past few centuries that nearly all schools and colleges founded for the education of the young have given much attention to the training of the mind and paid little attention to the training of the body. It is only within a very few years that technical schools for training in the manual arts have come into existence, and there is no school or college that I know of where the education of the body as such is made an essential part of the curriculum. To sustain this theory as to the superiority of the mind over the body, the young are frequently told of the great work that has been done by Pascal, Darwin, Spencer, Marcus Aurelius, William Wilberforce, Robert Louis Stevenson and others, though they all had inferior physiques, as contrasted with the mental and moral efforts of the world's champion oarsmen, matadors, pugilists and athletes with their splendid bodies.

Danger in extremes

These exceptional cases only serve to illustrate the extent to which nature will go in her variations from the normal when special development for any purpose is required. Danger lies in the direction of the extremes, and unsoundness, disease and extermination are the inevitable results of too great a departure from the mean. In mental and physical development nature always tends toward the normal. In refusing to perpetuate the extremes she keeps down the number of freaks and anomalies. In seeking for man's success in competing with rivals and contending with the forces of nature we have not been sufficiently mindful of what he owes to the division of labor and the ability to co-operate with others. This is now becoming very apparent in the building of a community or nation—it is equally apparent in the building of a sound physique.

The limit of physical development

One of the first difficulties encountered in trying to develop the muscles of any particular part of the body is that a limit in size and power in these muscles is soon reached. If these muscles are on the calf of the leg, for instance, and one is desirous of making them larger and stronger, it is often found necessary to develop the muscles in other parts of the body before the calf muscles will increase beyond their first limitation. Finally a stage of development is soon reached in each individual beyond which no amount of further use or practice will carry it. This was for some time a paradox—now the same law is known to apply to all the other organs and tissues of the body. Larger muscles in a limb would not only call for larger bones, tendons and connective tissues, but for larger blood vessels, a better developed heart, lungs, nervous system, etc.

The interdependence of one part of the body upon another has been brought about largely through a differentiation of the tissues and organs. In the lowest forms of animal life, as in the amoeba, for instance, the little animal feels, moves, breathes, catches and digests food, although it consists of but one cell. The higher animals perform their functions by means of different cells set apart in special organs. Thus we have bony tissue, cartilaginous tissue, muscular tissue, respiratory tissue, nerve tissue, etc., each having special duties to perform. The physiological division of labor among the higher animals has resulted in the better performance of the specific functions of the various organs and tissues of the body, and consequently in the development of the highest species as represented by man. The development of the higher animals has been greatly favored by the establishment of the heart, lungs, blood vessels and nervous system, by which the food and oxygen of the air is carried to all parts of the body and the exchange between the different tissues is regulated and controlled.

The internal struggle for existence

The high physiological position attained by man has not been won without a great internal struggle. We are all familiar with the external struggle for existence—but how many of us have thought that the primary and fundamental struggle must be that of the organic forces at work in creating a structure capable of pushing its way amid external forces?

The organism must find a footing in the world before it can compete with rivals and defend itself against foes. The reason why fifty per cent. of the children born fail to find a footing in the world is in consequence of inherited weakness, internal dissensions or imperfect development, all of which may be traced to malnutrition. All parts of the body are competing for their pabulum or food, which is supplied by the blood. The parts which are most active generally get the larger share, but as the quantity of blood in the body is limited some other parts get less than their share. This leads to the establishment of an organic weakness or constitutional defect. If one of the parts deprived of its proper nutriment is an important organ, then imperfect function will result and all parts of the body will suffer in consequence. Sometimes an excessive accumulation of muscle tissue impairs the efficiency of the muscles, the person becoming muscle bound, as it is termed. Whenever there is an encroachment of one tissue upon another there is always a disturbance of the normal balance, which readily passes into a pathological state. Fatty degeneration of the heart or some other diseased condition results.

Due proportion necessary to a sound physique

A sound physique, therefore, implies a bodily condition in which there are not only well-proportioned limbs, perfection of structure and harmony in muscular development—but a condition in which harmony and accord exist throughout the whole organism. If these facts are well founded then the health and soundness of the various tissues and organs of the body must depend upon their receiving a just share of the body's nutriment. The distribution of nutriment we found to be greatly influenced by the activity of the different organs and tissues. We have seen that man's status as an animal among animals was the resultant of an all-round conflict with nature and brute forces which must have given him the vigorous all-round physical development with which he is naturally endowed. We have also seen that his recent progress as a social being has been greatly dependent upon the division of labor and the further culture of his fingers, hands and brain. But the division of labor through the invention of machinery calls for the use of very few muscles and faculties, and many occupations do not furnish enough all-round employment for the body to keep it in good health.

The physical atrophy in specialized work

Think of the simplicity of service now expected of many of the employes in our great railroad systems. One man sells a ticket, another watches it drop in a box, another rings a bell or blows a whistle, another presses a button, another opens or closes a gate, and so on. This is fairly typical of the little physical and mental effort now required to earn a livelihood in many of our great industries. It is hardly necessary to add that such a pursuit carried on persistently through a long term of years without any other life interest to supplement it would lead to general atrophy of the muscular and nervous systems. In other words, a larger portion of the working classes, though toiling for wages and food externally, are literally starving some of their bodily tissues, if not their very souls, for want of sufficient nutriment. For it matters very little how much food is consumed or how much air breathed, the tissues can only be well fed just so far as they can be induced to take up this food and air as a result of their organic activity.

The true use of the time-saving machine

As division of labor and use of machinery have greatly reduced the amount of all-round physical and mental effort now required of the individual, as well as the hours of his employment, it becomes a matter of vital necessity that something should be done to make up for the deficiency of his occupation as a health promoting, body building and mind developing agency. The leisure now gained through the great reduction in the hours of labor affords an admirable opportunity for physical and mental culture and recreation and for all-round personal improvement. To embrace this opportunity is the only way to counteract the narrowing and deadening influence of our highly specialized occupations, and to keep up the mental and physical vigor of the race. But our schools, colleges and athletic clubs all tend to specialize, and with the increasing demand for more industrial training less and less time and attention are being given to mental and physical culture as such. If extent of knowledge, the advancement of science, skill in labor, excellence in art and pre-eminence in sport, are all thought worthy of the greatest effort on the part of the individual, it is difficult to see how a high degree of specialization is to be prevented.

This concentration of effort and singleness of pursuit frequently brings success—but it is success dearly purchased by many brain workers, by emaciated limbs, feeble digestion, weak lungs, congested liver or exhausted nervous system. In spite of the fact that there are a few exceptional men who have won great distinction though handicapped by diseased organism and a feeble body, I am prepared to maintain that the world's work has not been done by invalids, but by men of a vigorous constitution and a sound physique. This applies to those who have worked with their brains as well as to those who have worked with their muscles. This must necessarily be so, since the brain, being an organ of power, depends upon the fuel received as food through the circulation of the blood. Thus the lungs and heart are immediately involved. These organs again fall back upon the digestive apparatus and this apparatus upon the tone of the muscular system, which, if feeble, may impair the capacity of a good heart, sound lungs and a well constituted brain.

The capacity for brain work limited by the physique

The capacity of a brain for work, then, may be said to depend upon the soundness of the physique. By a sound physique I do not mean the supreme development of the muscular system as frequently represented by heavyweight athletes and professional strong men. I mean the natural physique as found in the youth of both sexes ranging from ten to seventeen years of age. The observations made upon some thirty thousand school children in St. Louis, Mo., in 1893, established the fact that children of the same age of superior physique, as shown by their superior height and weight, were also superior in their mental capacity as shown by the school records. This fact has been confirmed by more recent examinations of several hundred thousand children made by different observers at Chicago, Ill., Cambridge, Mass., Omaha, Neb., London, Eng., Berlin, Germany, and St. Petersburg, Russia. The same observation of a superior physique accompanying superior mental faculties was shown in the members of the Royal Society of England.

I should like to believe that it would be true of any distinguished body of intellectual workers in this country. Considering the large per cent. of professional men who were rejected as unfit for service during the civil war, I fear that this assumption might not be verified. I regret to add, also, that this fact is not borne out by any correspondence between the physical measurements and the rank-book tests of our college students. The athletic students, however, devote much of their time and energy to the development of their physique, while the scholarship men devote themselves almost exclusively to mental work.

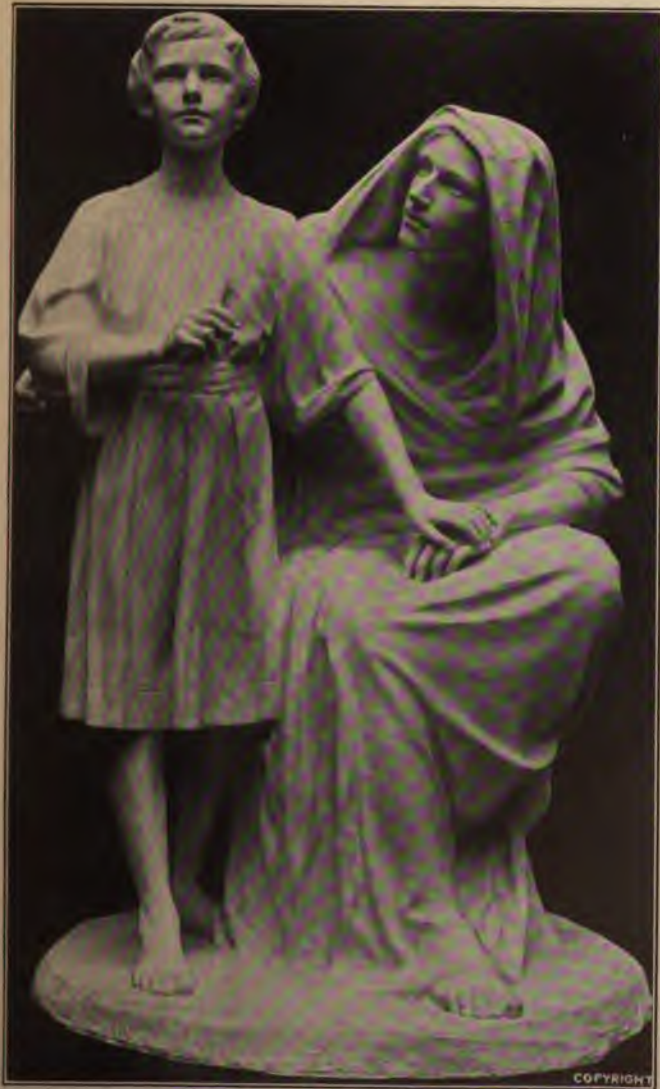
The college athlete and the rank-book

Is it not a sad commentary on our system of higher education that the natural condition of a superior brain in a superior body, that undoubtedly exists in our youth during their early teens, the formative period of their lives, should not be carried through their maturity to manhood? Perhaps it is, and the man with a superior physique will be heard from later in life. If so the rank-book of the instructor records the faithfulness and industry of the scholarship man rather than his superior brain power. To this interesting industry should be coupled his willingness to sacrifice his bodily soundness or health in hopes of gaining greater mental power and efficiency. This is a futile assumption, as we have already shown. So futile, that in the treatment of criminals, dullards and the mentally defective, who have, as a class, very poor physiques, it has been found necessary to reconstruct and improve them physically as far as possible, by systematic exercise, bathing, dieting, etc., before they can be much improved mentally and morally. With this method of procedure most remarkable results have been accomplished. Are not our school children and college youth worthy of as rational treatment as is bestowed upon criminals, dullards and defectives? Some of us think so and have been advocating for years, the training of the muscles, the cultivation of the senses, and the improvement of the physique as a fundamental basis for a broader, sounder and higher mental development.

Great nations and physical development

All of the great nations that have ever done superior intellectual work have preceded this mental awakening with a period of great physical activity and bodily improvement. We are already beginning to record a very considerable increase in the average measurements of many of our school and college youth. In 1880 the average height of the students at Harvard University, including all classes, was 67.7 inches, and the average weight was 135.2 pounds, both measurements being taken without clothes. In 1906 the same class of students at Harvard averaged 68.7 in height, and from 140 to 143.3 pounds in weight—the scientific students weighing about 3.3 pounds, on the average, more than the academic classes. In 1880 only fifty per cent. of the Harvard students would have surpassed the height and weight of the army average. Today over sixty-five per cent. would pass this standard. This is a most remarkable uplift in growth and development for any considerable body of men in any country or community to have attained in twenty-five years, and is a great tribute to the noble efforts that have been made during the past quarter century to interest our school and college youth in athletic sports, plays, games and gymnasium exercises.

I am optimistic enough to believe that, when the adoption of regular systematic physical activity for our youth of both sexes become more universal, a gradual improvement in physique will be accompanied by an improvement in mental and moral attainments. To hasten this day the whole boy must be put to school, and the school and college must assume the responsibility for his mental, moral and physical development. When this time arrives the community will not be slow to realize the true significance of a sound physique.—[*From the "Annals of the Academy of Political and Social Science," by permission.*]



HER SON

By Nellie Walker. Copyright, 1908.
In the Art Institute of Chicago.

II

HOW TO KEEP THE HOUSE HEALTHFUL

JULIA M. JOHNSON
Press Chairman, Missouri State Federation of Women's Clubs

THE world is learning faster now-a-days, at least its medical men are getting hold of the clues to many disorders which have wrecked generations, and what they say should be known by mothers, who have the health of households in their hands. If, as some say, the soul is to be reached through the body, then each mother who familiarizes herself with the laws of the body, and the sanitary and hygienic laws that govern it, is making real advance in right living, and in resistance to the inroads of disease.

Protection against sewer gas

The vital importance of domestic sanitation and the deadly effects of sewer gas upon human life, are two subjects that have claimed the attention, not only of the medical men of the day, but the laity as well. It is universally recognized that sewer gas is a medium for the conveyance of disease and in all well designed systems of sewerage, stringent precautions are taken to keep it out of houses. It is equally certain that the dangerous character of sewer gas is reduced, if not entirely removed, by free admixture with the oxygen of fresh air. Sewers should therefore be liberally ventilated, not only for this reason, but to prevent the air within them from ever having its pressure raised by an influx of water so considerable as to force the "traps" which separate it from the atmosphere of the dwelling. The plan of ventilation now most approved, is the very simple one of making openings from the sewer to the surface of the street at short distances, and covering them with metallic gratings.

Every house plumbed for sink, bath, closet and laundry, has its own networks of pipes, and all lead to a common sewer. These must be plumbed to remove sewage from the house quickly, without leakage or deposit on the way; the air within them must be kept out of the house by placing a water trap at every opening through which sewage is to enter the pipes; all internal pipes must be gas tight and freely ventilated by a current of fresh air and the air of the common sewer must be rigorously shut out from all drains and pipes within the house. To disconnect the pipes of each individual house from the atmosphere of the common sewer, is the first principle of sound domestic sanitation. When this is done the house is safe from contagion without, so far as contagion can come from sewer gas, and, however faulty in other respects the internal fittings may be, the house can suffer no other risk than that which arises from its own sewage. Another important reason for ventilation is, that owing to the corrosive action of sewer gas, the life of the waste pipe is greatly shortened if provision for the free circulation of air be wanting or insufficient.

Danger in neglect of fittings.

We recognize a broad distinction between the sewage from closets, liable to the most dangerous taints should disease occur within the house, and the comparatively innocuous sewage that comes from basins, baths and sinks. Conceding that the plumbing of the house was perfect as may be, and the connection with the common sewer made after the most approved of modern methods, the internal care of the fittings demands careful attention. Multiplying conveniences in a house by having wash basins in bedrooms and dressing rooms involves great risk, because it places each room in direct communication, through an ordinary trap, with one soil pipe. The bathroom, with its tub, closet and bowl, and the kitchen sink and basement laundry, are sufficient for ordinary households, leaving the living rooms and sleeping rooms pure and sweet. In sleeping rooms, and all over the house, one important precaution must impress itself on the housewife, that is the necessity of keeping all waste pipes and sinks closed when not in use. It is an oversight which has been fatal in countless, unknown instances, to leave these ducts of foul air always open to bring the worst air constantly into living and sleeping rooms. The infection of air, food and drink, by this hitherto unsuspected cause, is frightful. Milk or food for children, left in the bathroom becomes, in an inconceivably short time, impregnated with deadly vapor given off by the waste pipe. Cases of diphtheria have been traced to infection in this way. If milk can be so infected, how much more is the air, that delicate fluid which imbibes the deadly vapor escaping from slime lined pipes and receptacles of waste? It is only necessary to inhale the air of the waste vent of the most sumptuously fitted porcelain bath to be convinced of this. The way to guard against this enemy, which lurks invisibly in our houses, is to keep all drains closed when not directly in use. The sink in the kitchen can be sealed against foul air by removing the grating screwed over the waste pipe and inserting a large rubber stopper of the kind used for bottles containing strong acids. A piece of strong twine can be inserted in the stopper for the purpose of removal.

Keeping the sink closed

I think no part of the house contains greater menace to health than an open sink, owing to its proximity to the pantry and household supplies. The lightness and freshness of the air is very apparent on entering a kitchen where the sink is kept constantly closed and food and milk in a pantry adjoining, keep fresh longer. You may scald your sink and flush your waste pipes daily, but owing to the rapid decomposition of waste matter adhering to the sides of the pipes, they are always the carriers of more or less deadly poison. The stopper should always be kept in wash basins and bath tubs and clean water standing in them when not in use. This dread of sewer gas is no whim of an ultra-fastidious person, but a real, dreadful menace, which unsuspected, slays its thousands by slowly contracted diseases and has wasted the freshness and youth of thousands more.

Care of the laundry

The same watchful care required for the sink is necessary for the laundry. Tubs should never be allowed to stand with suds in them, but after use should be thoroughly cleaned, stoppers inserted, and fresh water turned over them. An ill-kept laundry is capable of giving disease to a whole household. No matter how pure the air may be that passes through living and sleeping rooms, bedrooms communicating with open waste pipes frequently give their inmates diseases.

If, during the day, the pipes cannot always be kept closed, it should be the practice of every good housekeeper to make a tour of the house before retiring to see that every waste pipe is guarded by a close stopper. In some cases the daily ablutions are performed in the bedrooms and the waste water emptied into jars. These are prolific sources of disease. No receptacle of this character should be allowed to remain uncovered, for concentrated gases of extreme virulence escape from them. Such vessels should be emptied at least twice a day.

Care of soiled clothing

Another menace to health is the soiled clothing often kept in the closet of a bedroom, together with cast off shoes from which emanate most unsavory odors. A writer has said that, "More epidemics are caused by accumulated minor neglects than anyone dreams, and the low health of many families would marvelously improve by attention to these small necessities of domestic habit."

Cleaning bathroom and sink

A few practical directions in regard to cleaning the sink and bathroom will not be out of place. In a family of medium size, the sink should be thoroughly cleaned once a week. Turn on the hot water faucet and flush the waste pipe until it is sufficiently warm to melt whatever greases may have adhered to its sides; then having previously dissolved a can of concentrated lye in a bucket of boiling water, pour slowly through the pipes. The wash basin, bath tub, and closet should be frequently subjected to the same treatment. For the purifying of the closet, a fine cleanser, and disinfectant as well, is copperas. Twice a month I treat my closet to a copperas bath. Twenty cents' worth from your druggist will last for four washings. I dissolve one-fourth of my purchase in a bucket of boiling water, and pour slowly into the closet, letting it remain several minutes before flushing; and occasionally, once a month is often enough, it is very cleansing and sweetening to pour into the basin, bath tub and closet, a strong solution of carbolic acid. This, however, is rather an expensive purifier, which may be beyond the means of many young housekeepers. It is not a wise policy to economize on the water bill. I believe the widespread epidemics of diphtheria and membranous croup that invade the homes of our people and desolate them are largely due to the fatal policy of our municipal officers in refusing to daily flush the sewers, on the ground that the city can not afford the extra expense. A long continued drouth gives disease germs a most favorable opportunity to develop and if the instructions of our health officers should be carried out, the city might be a little short of its water revenue, but there would be fewer desolate homes. It behooves every mother then, to see that in her own little kingdom, an ample amount of water is daily used to carry off whatever disease germs may lurk in the foul air of the waste pipes of her home. The living room should always be the lightest, sunniest, airiest of the whole house; well ventilated, thoroughly clean at all times, with books, pictures, flowers and whatever will delight the eye or cultivate the mind and heart, for there parents and children meet on common ground.

How to care for the bedroom

The care of the bedroom is of great importance to every mother of a family. A sleeping room should have nothing in it that cannot be washed or readily removed. The fewer things there are to catch the dust and obstruct ventilation the better. A clean, well-made bed that can be opened for the night without much labor, must always be attractive and in good taste, whether in a palace or in a cottage. One may tire of elaborate furnishings, but never of simplicity, in the sleeping room. The simpler all the arrangements of the bed the better. When one can afford it, nothing is better than hair mattresses. There are other materials that upholsterers use that are cheaper and quite comfortable. Home-made mattresses are rarely easy. Any irregularity in the mattress interferes with the comfort of the sleeper, and the home product is apt to suggest anything but a bed of roses, unless you think of it with the thorn thrown in. A mattress, to be comfortable and wear well, should be made in two pieces, a square and a rectangular piece. It can then be turned many ways and will wear much longer.

Airing the bed

I think I will tell you how to make up a bed. In the morning take each blanket and sheet from the bed separately and hang over chairs, so that the wind will blow through them. Shake up the pillows and bolster and place in the air. Turn up the mattresses so that the air may circulate about them. Air the room and bedding for an hour at least, longer if you can spare the time. Before putting the mattresses back, turn them. Put on the under sheet, tucking it in well at the head. Pass the hands over it carefully so as to take out every wrinkle, and then tuck it in at the sides and feet. Next place the bolster in position. Put on the upper sheet, tucking it well under the mattress at the foot. Next put on the blankets, tucking them in at the foot and sides, should the blankets be double, have the open ends towards the head, that it may be possible to turn one back if the double thickness proves too warm. Now, turn the sheet back on the blankets, and then turn blankets and sheet both down in one smooth fold. Next put on the spread, letting it come over the bolster. Then over the bolster, place the pillows that are used during the day. All through the work, bear in mind, that it is important to have the mattresses level and to put on the sheets, blankets and spread without a wrinkle. At night all that will be necessary will be to take off the spread, and fold it, then turn back the blankets and top sheet and the downy bed is ready, and tired nature's sweet restorer, balmy sleep, comes almost uninvited.

III

PREVENTION OF INFANT MORTALITY

FLORENCE HARTLEY GREENE
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What we pay the Piper

DO you recall being told at your mother's knee the tale of the Pied Piper of Hamelin? You remember that this Piper with his magic music was able to charm all living creatures. He bargained with the fat Councilman of the little village of Hamelin to rid it of all its rats and in return he was to be paid 1,000 guilders. The Piper drowned all the rats, and then the worthy Council of Hamelin refused to pay the Piper his 1,000 guilders. They preferred to spend that money on Rhenish wine. The Piper finally evened the score by playing on his pipe a tune so attractive that all the rosy-cheeked, flaxen-curled baby boys and girls of the town ran laughing and dancing after him, and he disappeared with them into the mountain's side and never returned. Since that day, and long before it, we have been paying the Piper and always with the same precious currency—our own rosy-cheeked, curly-haired baby boys and girls.

It is to me one of the most marvelous bits of inconsistency to be found that we Americans as a nation should wear our bodies out by the very strenuous lives we lead in our mad rush to accumulate material wealth for our children when they are older. In fact, we are so eager to bring this desirable thing to them that we forget about the babies and let many of them die in their infancy.

We do not know just how many die any year, because we have not cared enough about it to have either their births or deaths recorded. Our last census revealed the fact that in only seventeen states is there any attempt to record the births or deaths of children. From these seventeen it has been estimated that not less than 200,000 babies, under five years of age, died last year.

Our inconsistency

What is the use of a home if it fails in taking care of the infant that comes into it? Why wear out our lives in gathering together the good things of this world for the grown man if we carelessly let him die in his infancy? It is conservation of infant life that we should be spending our thought and money on, rather than spending it on forestry, water supply and mineral resources.

People have for long years recognized the value and desirability of registering cattle, horses, dogs, chickens and kittens; then why not men? Here is what the Secretary of the State Board of Health of Kansas has to say on the matter: "Poor old Kansas, bleeding Kansas, bleeding money, wheat and corn at every pore. A land of smiling sunshine, of winding streams, where you have but to tickle the soil to make it laugh a harvest—a land dotted with school houses and growing towns and villages—a land of pigs given adipose—of sleek cattle, of strong horses, of handsome women, of bouncing babies, of homely, rugged men—a land where no one dies except through accident or overeating. Poor bleeding Kansas cannot afford to pay twenty-five cents to register those bouncing babies, and while for years they have duly registered their fine pigs, their cows and horses at an expense of from fifty cents to ten dollars each, they deny their future citizens, the potential farmers and mothers of this great Republic, the right of registration, the establishment of legal birth rate for the pitiful sum of twenty-five cents."

In spite of its up-to-dateness in other matters, our own United States has been slow in realizing that the babies of this generation are to become the material out of which the citizens of tomorrow are made, and that one of their rights as such is a record of their birth. Every great nation except the United States keeps such records. With the imperfect records at its command the census bureau has approximated that the death of infants under five years of age for the year 1908 was 200,000—one-fifth of a million of child lives. The Spanish-American war cost us only 6,000 men in deaths from all causes. Think of the public demonstration of our grief as a nation over their loss. It was a great loss and our nation should recognize it and spend endless dollars on peace congresses and arbitration boards to do away with such dreadful sacrifices. But what about those 200,000 babies—thirty-three times as many lives—that are dying every year?

Our distinguished statesman, Theodore Roosevelt, has had much to say on the question of race suicide, and greatly deplores the fact that not more children are born in our country. I agree with him that we need all the children that we can take proper care of. But when we are letting 200,000 die every year, of whom our physicians say 100,000 could be saved by proper care, why increase that death roll? If the 200,000 that died were the unfit only, it would be another question, but the fact is that those babies were taken from the ranks of the best born; they do not include the physically unfit. I have never been able to agree with the old lady who once said with some pride, "I have done my duty to the Lord, for I have brought into the world thirteen children." Inquiry showed that these had all died in childhood except four. I say "hats off" to the family of thirteen children who have grown to useful and honorable manhood and womanhood, but I fail to see honor in a long line of tiny gravestones in the cemetery.

Dr. Fisher of Yale has investigated the causes of deaths of the 200,000 infants who died in 1908, and finds that fifty-five per cent. of them were unnecessary. The little fellows were brought into this world and not given a fair chance—not even an opportunity to fight for their lives. One hundred thousand useless deaths in one year; 100,000 homes heartbroken uselessly. The cost of the average infant burial is ten dollars. That means $1,000,000 spent for burial expenses that might have been spent in making babies laugh and gurgle and grow strong.

The State of Missouri, through its agricultural college, spent $40,000 last year in the investigation of the diseases of hogs and on methods of producing fine specimens of adult pigdom. We are making strenuous efforts to eradicate disease from the porcine family. We have an experiment station for the study of their diseases, and whenever an epidemic appears in any farmer's herd of swine, he telephones at once for an expert to come and take care of them. What does this same man do when there is an epidemic of measles or diphtheria in his school? Does he telephone for an expert, or does he trust to luck that the babies will escape. Two hundred thousand failed to escape in the United States last year. Why should a state spend $40,000 to keep its pigs well and strong and not one penny for its babies?

Mortality in rural districts

In the eleven months between February 1 and December 31, 1910, 105 homes in this town were gladdened by the coming of a young child. Only seven (six per cent.) of these homes were forced to pay their precious tribute to the Piper. This county as a whole was not so fortunate, because it lost thirty-three (twelve per cent.) of the babies born during that period. The record of the county, as a whole, shows that it does not take good care of its babies under five years of age. During this period twenty-two children, under five years of age, were lost from measles. Twenty-eight per cent. of the death rate in children, under five years of age, was due to measles—a contagious and easily preventable disease. That means that the county does not observe rules of quarantine. Children under five years of age do not attend school, and there is no reason why, if strict quarantine is observed, it should lose anything like twenty-eight per cent. of the death list to measles. When the county realizes how much better chances the country child ought to have for his life than the city child then the fact that the rural conditions here are so bad as to make a baby's chances for escaping contagions twice as bad as in this town, then it will not wonder that the country is being deserted. The babies under five will have to go to town to escape with their lives. This county's problem is not how to keep the young man and the young woman on the farm, it is how to keep the baby on the farm.

The answer is simple—clean milk and enforced quarantine laws.

What killed the babies

To come at once to the root of this problem, the truth is that nothing can save these babies but intelligent, educated parents. Fifty-two and one-half per cent of these deaths were due to digestive diseases.

Physicians call them filth diseases. That means, in most cases, unclean food, improper food, or ignorance in adjusting food to the child's need—ignorance and neglect—and this must be laid at the mother's door.

I am not willing to believe that this is due to a lack of maternal love. I believe that the instinct that makes one's heart throb and the tears come at the appeal of baby fingers is still within us. Last winter two Indian women, with their babies, were driven by cold and hunger to forsake their miserable tepees and start across the pathless prairies of North Dakota to the reservation. A snowstorm came up and they lost their way. When they were found the following day, the mothers were both dead, but clasped to each mother's frozen breast was her baby, warm and smiling, wrapped in its mother's clothing and blanket. This incident seems to indicate that maternal instinct is still alive in some of our American citizens. Is it possible that it is confined to the primitive mothers only?

Effect of civilization on infant mortality

Civilization, as it is expressed in our modern life, has robbed us of some most valuable things. One of the greatest of these losses is expressed by the fact that so many of our babies are bottle fed. When a mother places her baby on artificial food, either because she cannot, or will not, feed it naturally, she decreases its chances for life just fifty per cent. This is not a pleasant fact, but let us face it fairly and squarely. If a mother can feed her baby naturally, is there any possible reason why she, as an individual, should not do so, or why we, as a nation, should allow her to take from that child half of its chances for life?

Our social and industrial conditions have robbed the mother of the power to nourish her own offspring in many cases; but they have not trained her to be able to prepare a substitute for the nourishment she should normally produce, nor have they furnished her, as yet, with any means by which she can learn to prepare such a substitute. The ignorance of women on such subjects is tragic. For example: the sight of a clinical thermometer puts the average woman in a nervous chill, when she ought to see in it her best friend.

The conservatism of women

Men tell us we are conservative. This conservatism has kept us at home, has made us contented with the ways that mother and grandmother had. We have not realized that conditions have changed in the homes and have not accommodated ourselves to our new environment. We have to meet conditions of hygiene, sanitation, bacteriology and sociology in our homes of which our mothers did not dream and we have not been trained to meet them.

Dr. Burrel, president of the American Medical Association, says: "It is difficult to change the habits of parents, but the children can be educated into acquiring habits that will maintain a better standard of health and living." That is to say, you can not educate women, but you may be able to educate girls.

How to make expert mothers

Personally, I do not agree with these gentlemen, for while I recognize that there is some truth in what they say, I am very optimistic as to what women will do if they are given a chance. If we wish a man to be an expert in soils, we send him to a college to study soils, and put him in communication with the National Bureau of Soils at Washington. Or, if it is horticulture, or dairying, or engineering, we do the same thing. If we have a sheep, horse or a cow of especially fine pedigree, we put it in the care of a man trained for that particular thing. But how is it with our babies? What opportunity has the average young woman had to make herself equal to the great task of taking care of this most difficult of all young animals to rear? The most difficult to bring to his fullest physical and mental development, because he is the topmost bough of the evolutionary tree. I have not been able to find a single college or institution of any kind that gives courses of study designed to train married women for their task. Many courses are given in our universities and normal schools that will give the foundation principles on which intelligent motherhood must rest, but none are given as preparation for motherhood alone. It ought to be as natural for a woman to go to an institution of learning to fit herself for her life work of home-making and motherhood as it is for a man to study for law or for the ministry. When we have realized that to make intelligent mothers who can bring into the world strong, healthy babies and rear them to equally robust and efficient adults, we must educate women as well as girls. Then, and then only, shall we cut down our per cent. of infant mortality. Women must have thorough courses in the scientific subjects necessary for a grasp of the *principles* involved in intelligent motherhood, and not a few didactic lectures or dictated formula for modified milk. You would as well give an untrained seamstress one pattern and tell her to make all the family clothing by that one pattern. The results would no doubt be equally felicitous in both cases.

Taking the civic steps to reduce infant mortality

It is especially desirable at the present time that the women of Missouri should aid in the support and insist upon thorough enforcement of the present excellent registration law that has been in force in our State since February 1, 1910. Missouri has taken a long step in advance in the passage of such a law, and it is being executed very thoroughly by the State Registrar, Dr. Frank B. Hiller, Jefferson City. A strong moral support in the community will help the registration officials to make it the success that it ought to be and I hope each of you will go home and register your own babies, because we need the facts as to births and deaths of babies.

After registration of births and deaths, the next step in reducing the price that we annually pay the Piper is a clean milk supply. In towns our municipal authority must see that the milk supply is above reproach, and in the country the father must see that the milk furnished his household is CERTIFIED, and spell it with every letter a capital.

The third step is the help we may give our municipalities in enforcing laws for sanitation. Dr. Cutler of Columbia has just sent out a letter asking every grocer in the State to have a Spring Opening at which he shall open for inspection his refrigerators, storerooms, etc. You must go if there is such an opening in your own town and insist on its being kept up to that Spring Opening standard. We must help our city council in segregating contagious diseases, and in providing pure water. These three points will include all the diseases that are specially fatal to infants, except the gastro-intestinal diseases, and in fighting those diseases the education of mothers is absolutely necessary. A milk depot can supply clean milk, but it cannot keep it clean until it reaches the baby. It cannot keep infected flies off the nipple of the bottle as the baby nurses, or away from the baby's mouth as it sleeps. We mothers must do that. There is another long and most interesting story to tell of what we may do for the total elimination of that most active dispenser of disease germs, the house fly.

Some home precautions

Investigation has proven that one takes typhoid fever only when he receives into his mouth some of the bodily excretion from a person who has previously had typhoid fever. Not pleasant to think of, but I would rather think and talk about it than to do it and have typhoid fever. This excreta in many cases is carried by flies, crawling over or hatching in infected material and then carrying the germs on its body and legs to food on our tables or washing its feet in the milk jar. While this matter has not been definitely proven, there is every reason to believe that the intestinal diseases that take so many of our babies in the summer are carried by flies. Just here I must put forever under the ban that infanticidal invention, "the baby comforter." These "comforters" are psychologically and physiologically wrong anyway, and when you stop and think that the minute the baby drops that "comforter" from his mouth, the flies are swarming over it, you realize what a prolific seat of disease it must be. Why can we not realize that the house fly is a pest of which we might rid ourselves if we would only use concerted, persistent effort? How many men realize that when they allow flies access to the refuse of their stables, or when they allow an unscreened soil pit, or garbage can, that they are providing a place where flies delight to breed. Oh, that every state and all local boards of health would plan and carry out a campaign against flies that would rid us of them and give us our quota of loved ones who have been subjected to tuberculosis, typhoid and such other diseases brought us by the house fly!

The strength of parental love combined with knowledge

In this effort at conservation of our children and homes from the enemies that beset us on all sides we, as women, shall not be alone. The men stand ever willing and ready to help. The primitive instinct of protection of offspring is strong in men, and I thank God that it is. An incident that shows just how strong this instinct may be came recently to my notice.

Two years ago a baby boy opened his brown eyes in the home of one of the leading scientists of America. For three weeks he slept and ate and grew as a normal baby should. Then something went wrong with his digestive tract, making abdominal incision necessary. The child survived the operation and was doing nicely, when, for some reason that a layman can never understand, the stitches pulled out and the operation had to be repeated. The child had been without food for several days and it could not recover from the shock of this second operation. The father came from his laboratory just at the time when four of the greatest specialists on infant surgery had declared that the baby's minutes were numbered. The little body was growing cold, the lips and tongue were shrunken. The last man child of a long race of distinguished scientific men was dying. When the father asked if there was any hope, the doctor replied: "The child has been without food so long and has lost so much blood in the operation that we cannot save him." The father said: "If he needs blood, take mine. I am perfectly sound and well. Give him my blood." As a last possible chance, the experiment was tried. The father bared his arm, sat there and watched the physician as he opened the artery under the knee of the unconscious, seemingly dead baby and connected it with an artery in his own wrist. Instantly the circuit was complete and the warm, strong blood from the father's great loving heart sent the life fluid pulsing through the tiny body of the little babe. The shrunken little figure responded at once. The face and lips filled out, the heart bounded, the chest rose and fell, color returned, the baby lived again. What greater miracle ever happened? That baby is today a rosy bouncing boy, and that father said to me as he showed me the scar on his wrist, "Oh, that was a small thing to do. I was so interested in the baby that I did not feel the pain when they cut me." Was ever more honorable scar won from saber thrust or bullet wound? Is paternal love lacking in our country? No. It is here in greatest abundance, but it seems to be guided by blind impulses more often than by quiet, sane reason, as in this father. We are all willing to lay down our lives for our children. That is an easy thing to do. *What we need to do is to keep our lives and use them in protecting intelligently the little ones about us.* Let us learn the way that will make it possible to save these 200,000 babes every year—our own babies, and those of the family in the alley and the slums of the big city. Education of parents can do so much along this one line.

Civic forces to employ

Many forces may be used to help us in this matter of educating the parents. Our physicians will help, our state normal school and state university professors will help with lectures and demonstrations; our state boards of agriculture with farmers' institutes and lecturers, home-makers' conferences and women's clubs will help; the United States government will help with bulletins and lecturers and lantern slides; conferences on country life such as this has been will help more than we can measure.

With so many organizations willing to help, it would seem that we ought to accomplish something. Do you recall the race that Alice ran with the mouse, the hare, and some others, when she was in Wonder-land? Then you recall that they all stood in a circle, each one ran when he wished and stopped when he was tired. They made a great flurry and noise, but each stood in his own place all the time and accomplished nothing. We must not run our race in this way. Let us clasp hands and run all together in straight lines for a definite goal; or better, let us apportion this race in relays, each one carrying part of the burden, and in time we shall reach our desired goal. Then shall we have a National Department of Health that shall be considered just as important as our Departments of Agriculture and Commerce. We shall make the Conservation of the Infant and the American Home the most important business of our lives and every woman and every man shall be trained for intelligent home-making.

IV

IS YOUR BABY REGISTERED?

Vital statistics in the United States

THE director of the census says in a recent publication: "It seems to me that there is almost nothing more important in the entire field of statistics than vital statistics, because of their direct bearing on the health, and consequent welfare, of the people. It certainly is both strange and shameful that the United States should be so far behind the other leading countries of the world in the registration of deaths, and even more so in the registration of births."

Sanitary reasons

The great importance, perhaps even the supreme importance, of accurate vital data for all sanitary work has been recognized since first sanitation became one of the most important applied sciences of modern life. Public health officials, philanthropic workers, and all who concern themselves in efforts for saving human lives, are especially dependent upon the proper registration of births and deaths, for certain information without which their work cannot be planned and conducted to the best advantage. It is evident that the thorough registration of death is essential in order to establish the nature and periods of chief prevalence of diseases and to indicate upon what causes the chief mortality at certain ages is dependent. It seems less thoroughly to be understood that the accurate registration of births is equally important for the study and prevention of infant mortality. In fact, the ratio known as *infantile mortality,* by means of which the destruction of infant life is measured and compared for different localities, is dependent for its validity upon the complete registration of births as well as of all deaths of infants under one year of age. Failing this basis of complete registration, the ratios are of uncertain value and may be very misleading. Such registration is a duty that the state owes to the child. It is necessary for its protection that its name and parentage shall be placed upon the civil records as soon as practicable after birth. Thus legally recognized as an addition to the population of the state, its future rights will be protected, and immediate sanitary precautions can be taken, if required, to save health and life. The registration of births may prevent the murder of infants by bringing the fact of the birth of a living child to the knowledge of the authorities. It may be used, in conjunction with notification, to insure proper prophylaxis against blindness, and the evidence of parentage and age thus afforded may be of vital importance to the child in after years. The helplessness of infancy appeals to the protection of the state and when the state has wisely said that such protection shall be extended, that physicians and midwives licensed to practice their professions shall register births so that legal records for individuals and complete statistics of infant mortality for the use of lifesaving agencies shall be provided, then the state owes it to itself that such regulations shall be carried out, and that no personal privilege, carelessness, neglect or lack of interest shall result in habitual violation of such laws.

The three purposes of registration

The chief purposes of the registration of vital statistics may be summarized as (1) legal records for the protection of the rights of individuals and especially of the more helpless classes, infants and women, and for court purposes; (2) sanitary records of the prevalence of disease, absolutely necessary for the effective work of all public health services, city, state and national; (3) knowledge of the character and movement of population, essential for enlightened legislation and study of the growth of the United States.

Why all deaths in the state should be registered.

Equally important is the proper registration of deaths. No civilized community should allow a human being to die and be buried without a proper official record having been made of the fact. Such records are indispensable in determining death rate, proportion of deaths and births, duration of life, rates of life insurance, etc., and in preventing and detecting crime.

When a human being passes out from our life it is important that an immediate record be made of all of the essential details of the event, because it is well established by years of experience that an accurate record in all cases cannot or will not be made unless the law requires it to be made at once. Such a record should include the facts relating to the exact time and place of death, the full name, age, sex, color, civil condition, occupation, place of birth, and other details relating to the individual, and also, a most important requirement, a statement by the attending physician, or by the health officer or coroner, of the *cause of death.*

These facts may be of the greatest legal importance. Certificates of death or certified copies thereof are in constant requisition in courts and elsewhere for the establishment of necessary facts.

Pensions or life insurance may depend on proper evidence of the fact and cause of death. The widows and orphans of deceased soldiers must obtain such proofs. Titles and the rights to inheritances may be jeopardized by the failure of records. The individual citizen of the state, no matter how humble his position in life or how insignificant his influence in the affairs of the community, is entitled to have an accurate record made of the important, the *vital,* events of his life. If the state has undertaken to do this, then the citizen has a right to expect that the state will perform its duty with precision and thoroughness; it is a disgrace to confess default in this important matter, and to admit the failure, year after year, of legislation devised for this purpose.

There is hardly a relation of life, from the cradle to the grave, which the evidence furnished by accurate registration of births may not prove to be of the greatest value, as, for example, in the matter of descent; in the relations of guardians and wards; in the disabilities of minors; in the administration of estates, the settlement of insurance and pensions, the requirements of foreign countries concerning residence, marriage, and legacies; in marriage in our own country, in voting, and in jury and militia service; in the right to admission and practice in the professions and to many public offices; in the enforcement of laws relating to education and to child labor, as well as to various matters in the criminal code—the irresponsibility of children under 10 years of age for crime and misdemeanor, the determination of the age of consent, etc. As the country becomes more densely settled and the struggle for existence sharper, many of those matters which have hitherto been of minor significance will take on a deeper meaning and acquire greater importance. Hence the urgent necessity for remedy of the defects which prevent a proper registration of births.

Farmer Hadley, of Indiana, dying, left his valuable farm in trust to his unthrifty son, to go to his granddaughter on her twenty-first birthday. The girl had been told the date of her birth and always celebrated as her birthday the annual recurrence of the same. However, when she believed she was 21, and claimed her inheritance, her father denied her age, saying she was only 19. The family Bible was appealed to, but the leaf with the record was gone. The court was in a quandary. A Solomon was needed for judgment. At last a neighbor remembered that a valuable cow belonging to the grandfather had given birth to a calf on the day the girl was born, and he could swear to it. Perhaps the grandfather had recorded the date of the birth of the calf. His farm books showed this to be the case. *The date of the birth of the human being was established.*

American Federation of Labor endorses vital statistics legislation

Under present conditions of employment there is constant temptation to misstate the age of the child seeking work. Valid evidence of the date of birth is often lacking. Many of the states have wisely set limits to the age at which children may work in gainful employment. Without a birth certificate, the age of a child is always in doubt. In such case, neither the employer nor the factory inspector can feel safe in permitting the child's employment. In a recent paper, an authority said:

Of 28,000 children, native-born and foreign-born alike, who get working papers each year in New York City between the ages of 14 and 16 years, three-quarters have birth certificates. The remaining quarter, who fail to get birth certificates, are native American children and those who come from certain parts of Russia or from the earthquake district of Italy. What earthquake and revolution do in Europe, official slovenliness accomplishes throughout the greater part of this nation, in depriving the children and citizens of the most fundamental of all vital and industrial statistics, the record of births.

Birth registration and child labor

If laws providing for a free and happy childhood and the prevention of the ills which follow from the employment of children under legal age are to be enforced, there should be the means of obtaining evidence of age beyond doubt.

Members of organized labor should take a personal interest in this matter from its importance to their families. Through their unions, questions such as these might be asked of the public authorities:

Is there a law for the registration of births and deaths in state and city? Is it thoroughly enforced? Are the births of children registered and if not, why not?

Proper registration of births and deaths is of great importance to the adult members of any community. Not only are such records necessary for the accurate study of disease and its prevention but they are also of the utmost importance in all questions relating to heredity, legitimacy, property rights and identity. No child labor law is of value, unless it rests on a system of birth registration and birth certificates, by which the child and the parent can be required at any time to produce positive proof of the age of the child. Laws regulating the age of consent cannot be rigidly enforced, so long as the question of the age of the girl depends on the statement of interested persons rather than on official state records. In practically all other civilized nations, proper registration of births is accepted as a matter of course. Europeans look with astonishment upon the American people, when they learn that there are at present only eight American states which have any adequate birth registration.

Value of vital statistics in securing legislation

One can hardly have any adequate conception of the value of vital statistics who has not had personal experience in their application. I have found vital statistics worth more than all other considerations combined in moving thoughtful, practical men to intelligent and effective interest in the importance of the public health of their localities. I could continue to cite examples of the force of vital statistics when applied to the practical brains of a community. There are many people who will become enthused over generalities, but the practical, cool heads that we usually find dictating municipal policies are men who want facts, and the only way to reach this necessary influence in bringing about sanitary reforms is through vital statistics. Vital statistics are the right arm of the health officer, and, in my opinion, the greatest defect in our southern states in promoting sanitary progress is the absence of vital statistics.

Commercial value of vital statistics

The dollars and cents value of accurate knowledge of the death rate is yearly receiving wider recognition. The development of the South has been greatly retarded by the absence of reliable mortality statistics based on the thorough registration of deaths. North Carolina is the first state of the "Old South" to register deaths under a state law of modern type applicable to municipalities. Virginia may follow (Model Bill advocated by the State Health Department), and efforts are being made in Louisiana, Mississippi and other states. It does no good to advertise worthless and foolish "statistics," with no sound basis of reliable registration behind them. Honest data fairly presented, will remove the imputation of unhealthfulness from many localities now tainted by the apprehension of insanitary conditions in the minds of possible incomers. Moreover, intelligent immigration will not go where the conditions of civilization are so slack that no regard is paid to human life, even so much as to record its beginnings and endings. A registration system is the sign of commercial progress and opportunity as well as indispensable to the removal of insanitary conditions. Better values for real estate, both farms and city homes; lower rates and the removal of discriminations in the issue of policies of life insurance in certain localities; the upbuilding of communities and the coming of greater commercial prosperity are some of the practical uses for which reliable vital statistics are needed today in many parts of the United States, and most of all in the South.

Prevention of infant mortality

The great movement for the prevention of infant mortality is based on knowledge derived from the registration of vital statistics. There were 187,453 deaths of infants under 2 years of age in the registration area of the United States during the year 1910, a very large proportion of which were due to preventable causes. No one knows how many infants died in the United States as a whole, nor even what the rate of infant mortality was in the registration area. It is necessary to have effective registration of both births and deaths to afford a correct rate of infantile mortality. The work of life saving of infants and children is seriously hampered by the lack of vital statistics and it is the first duty of all sanitary authorities and others engaged in the protection of infant life to secure the complete registration of births and deaths.

How births and deaths should be registered

The practical question is as to what form of law shall be enacted and what are the essential requirements for the successful operation of such a law. Much time and money have been wasted in the past—and are being wasted today—by attempting to secure results from laws that any person fairly familiar with the history of registration methods in this country would know at once to be utterly incapable of ever obtaining complete records. Some of the *worthless* methods that have been employed are:

Enumeration, The "Country System," Death Registration without Burial Permits, and Voluntary Registration.

How to secure registration

It is especially recommended that every effort be made to secure the co-operation of civic federations, women's clubs, public health leagues, labor organizations, local boards of trade and business men's associations and other similar bodies. In spite of the fact that no personal benefit accrues to any physician from a law requiring registration of births and deaths, and that most of the labor falls on the physicians, the activity and prominence of the medical profession in securing the passage of such laws has created the impression in the public mind that these measures are in some way of personal benefit to physicians and are of no particular interest to the general public. That this is not the case will be seen by considering the importance of vital statistics legislation to the public and its relation to all the important events of life. Public interest in this question should not be allowed to subside until adequate laws have been passed in every state requiring the proper registration of births and deaths and making at least as lasting a record of the most important events of individual existence as is made of blooded horses, cows, dogs and cats. The neglect of such matters shown by our American states is a source of never-ending wonder to European visitors and reflects no credit on our civilization.—[*Compiled from circulars of the Census Bureau and the American Association for Study and Prevention of Infant Mortality.*]

[A model law which has been endorsed by the Division of Vital Statistics of the U. S. Bureau of the Census can be obtained by addressing the Division.]

V

THE CARE OF BABY'S MOTHER

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Three factors in child welfare

THE three factors of greatest importance in determining the welfare of the child are inheritance, environment and food. It is vital to the progress of the race that children should be well born, that the parents should be strong and untainted, that they should pass on good habits of mind and body to the next generation.

Thoughtful care of the child should not be deferred to the time of its birth. It should at least begin with the care of the mother from the time she knows that she may expect the little one. Much misery and ill health on the part of both child and mother may often be prevented by an understanding of the conditions which prevail at this time and by giving better attention to a hygienic regimen for the mother.

The period of the greatest growth during the lifetime of the human being is during the nine months previous to birth. When a child is born, it is about five million times as large as the germ from which it has sprung. During the first year of its life growth is only about threefold, and after this it progresses much more slowly until maturity is reached. While right conditions are extremely important during the first years of life they are supremely important during the prenatal period. During these months, muscles, bones and nerves, the foundation for all organs and tissues, are formed. This is the time when the human being is created and the rest of life concerns itself with the development and education of that which is now produced. It is therefore vital to the welfare of the future individual to have the best possible environment during this period of fundamental growth. Nature had done her best by hiding the developing baby snugly away where it shall be protected as far as possible from outside interference; where it can be kept constantly and unchangingly warm; where its food can be supplied regularly and unfailingly from the blood of the mother; and where, from day to day, it shall be free as possible from change or disturbance. During the whole prenatal or "before-birth" period of its existence, the mother supplies both food and environment for the growing organism. It is only through the mother that the child can be reached, that its nutrition and general welfare can be controlled. It is therefore the mother with whom we are primarily concerned.

Exercise

Exercise of the right kind is as necessary now as at any time. A false pride should never stand in the way of outdoor exercise. Exercise with a free untroubled mind out of doors keeps both body and brain in better condition, keeps the muscles plastic and strengthens them for the trial which has to be endured. If only more thought were given to this one question of muscular development in women the danger and sufferings of childbirth would be very greatly reduced. Severe, overtaxing exercise or very hard work should be avoided. The ordinary housework instead of being harmful is generally distinctly beneficial. Running a heavy washing machine, working long hours at a sewing machine, bending for hours over fine sewing, fancy work or embroidery, riding horseback, in fact, any long-continued or straining effort should not be attempted by the average woman. In various states the constant hard work with long hours in factories is now regarded as sufficiently detrimental to women during this period to require legislation to prevent it. It should receive equal attention in the home. Overworked, worn-out mothers tend to produce weak, sickly children and weak sickly children are not an asset to family or community.

Clothing The clothing should be light and loose and warm. The wearing of tight clothing which constricts waist or abdomen is not only unwise but dangerous, both to the health of the mother and to the life of the child. Corsets should be discarded. This is not a time for false pride.

Air Fresh air is very important, for the body needs now as never before to rid itself quickly as possible of all poisonous wastes. Well-ventilated sleeping and living rooms, plenty of sunshine and fresh air, outdoor exercise whenever possible should be the rule. Growth and development are stimulated by sunshine and fresh air, food is more readily digested and assimilated and the whole organism is in better tone. A tendency to anæmia may often be corrected by a regimen of right food, fresh air and light outdoor exercise.

Diet The diet should be carefully regulated. Food is needed as usual to supply all the needs of the mother for energy, repair and building of tissue, and elimination of waste products. Besides this, provision must be made for the demand upon the mother by the child. The baby is born with bones and muscles; blood vessels and nerves; with a supply of iron stored in its body sufficient to make good for the first year the deficiency of iron in milk. All the materials used for this growth and for storing are drawn from the blood stream of the mother. If the food of the mother lacks greatly in any single thing or if her health is such as to interfere with right assimilation of food, both mother and child may suffer. When the growth or development is stunted by malnutrition before birth no subsequent care will completely overcome the bad results. If the defects in diet are slight, the development of the child may not be interfered with, but the mother may suffer. The rule is that nature cares most for the new generation and will protect the child at the expense of the mother. The supply of food needed for the child's development will be drawn from the mother's blood even at a considerable cost to her. If the diet is very poor or the defect in nutrition is very great both mother and child suffer.

Food

Proteid, so essential for the growth of the new organism, should be mainly in the form of milk and eggs, or some well-cooked vegetable protein food as legumes and cereals. Meat should be eaten in but limited amounts since it increases the work of the kidneys and they should be spared as much as possible at this period. In removing meat from the diet one source of iron is withdrawn. Eggs will more than make good the amount withdrawn.

Fats should be eaten only in such amounts as may easily be borne. Fat as it occurs in cream, butter, milk and eggs is better than fat in meats, in rich pastries or fried food, since the latter form is less easy to digest. The digestion is doing double duty and should not be overtaxed. Besides this, the organs of digestion are often a little crowded and have not their normal ability.

Sugars and *starches* should be eaten as they occur in cereals, legumes, nuts, fruits and vegetables, for in this form not only the energy of these two foodstuffs is supplied but other substances needed in the diet, are increased, particularly mineral matter and bulky material.

Mineral Matter.—There should be an abundance of mineral matter, iron for red corpuscles, phosphorus to stimulate growth, lime for bones. This will be supplied by a diet rich in fruits and vegetables, milk and eggs. Frequently the diet at this time lacks some one element of mineral matter, as iron or lime, or it may lack mineral matter as a whole. Anæmia, decayed teeth, or derangement of the whole system may result.

Constipation should never be allowed to continue for any length of time. The intestines should be kept free from any accumulation of waste matter, as poisonous substances result which are absorbed into the blood stream of the mother and interfere with her health and with that of the child. A tendency toward this disorder may be overcome in most cases by right regulation of the diet and proper exercise. The following laxative diet is suggested:

Whole wheat or graham bread; stewed prunes; properly cooked cabbage and onions; well-cooked oatmeal; shredded wheat; plenty of fruit, fresh or cooked; abundance of vegetables; if in normal health, six or eight glasses of water a day.

To sum up, the mother's diet should contain an abundance of eggs, milk, cream, well-cooked cereals, fruits and vegetables, meat in small amounts; it should be easily and completely digested; rich foods requiring great effort to digest them should be omitted.

A cheerful spirit

Cheerfulness is always a means towards good health. Gloominess may be the result of digestive disturbances but it may also cause them. Melancholia interferes with the mother's digestion and general assimilation of food. This may affect the composition of her blood and thus disturb the nutrition of the child whose food reaches it indirectly from her blood vessels. The same result may occur during the nursing period and many a grieved or angry mother has seen the ill effect of such emotion in a lessened or changed supply of milk.

The old idea that melancholy at this time perpetuated itself in the disposition of the child, thus marking it for its lifetime, has been proved untrue. Gloom does cause malnutrition and a poorly nourished mother may produce a sickly child. A sickly child is a suffering one, and may it not be allowed to be melancholy under such conditions without any mysterious prenatal influence? Gradually we are forsaking some of our former beliefs concerning this same prenatal influence. We know now that birthmarks are not due merely to a state of mind in the mother but to a condition of body, to some interference with nutrition, to some diseases or inherited condition of the germ, to some blow sustained by the mother which has affected the growing child, but not to a mother's sudden fright or fear or mental attitude unless these have caused actual bodily harm to her and to the growing child, or have so seriously interfered with her nutrition as to affect the food supply of the child. In other words, the prenatal bugaboo has been routed.—[*From pamphlet of the New York State Agricultural College, Cornell University, whose literature will be sent free to any one living in the state.*]

VI

THE NEW-BORN BABY

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The new environment

THE new-born baby receives and deserves our sympathy. All at once it is called upon to face new and very strange surroundings, to exercise recently developed functions, to adjust itself to a new set of conditions. A new food supply has to be digested by a previously untried digestive apparatus; a new way of taking oxygen begins through lungs never before called into play; previously circumscribed limbs are now free and must be exercised; and often, worst of all, it is faced by a large acquaintance of persons as ignorant of it and its real needs as it is of them. Its education now begins. A pathetic little figure, we must agree!

The same child

Our great ignorance of the growth and development of the human organism during the nine months it lies so snugly hidden away makes us feel that an unbridgable chasm separates the child which is born from the child before it is born. This very fact leads to much of our ignorant management of the small baby. In the few moments or hours which are occupied in accomplishing the entrance of the child into the outside world, there has not been time for it materially to change its needs. It has been accustomed to uninterrupted quiet, to a sightless, possibly a soundless and a certainly monotonous period of existence in which to accomplish a most wonderful growth and development. Its food has been supplied automatically, and under normal conditions satisfactorily. When it is born it is just an immature and undeveloped bit of humanity ready to use the newly developed functions, ready to be educated and trained to use others, but not ready to share largely the lives of the more completely developed. It still needs and should have something approximating as closely as possible the previous environment but which will be consistent with its new responsibilities of digesting its own food, getting rid of its own wastes, taking in its own oxygen, wearing clothes to supply its need of warmth, learning little by little to move its muscles, to correlate its actions and to adjust itself to other human beings.

Right physical habits

What the new-born baby is we know. What it is to be will depend about equally on two factors, inheritance and environment. A good inheritance may be marred by a bad environment, but the reverse is also true, for a poor inheritance may be overcome by careful training. It is a fatal mistake to think that education begins with school years. It begins with the first breath the child draws, and the education or training of the infant is as important in determining its ultimate characteristics as any that may come later. This is the period for establishing regular physical habits which will not only be the basis for future health but which will give the first foundation for an idea of obedience to law. If the child learns during the first year of its life to adjust itself to regular hours of sleep, to regular meal times, to a regularity of various body habits, its training is made easier for all future time. Irregularity of meals is the cause of many unnecessary deaths among children and where it does not actually destroy life it often leads to permanently impaired digestive functions. Irregular sleeping hours wreck many nervous systems. Vicious habits in later years may often be traced to a lack of systematic training in infancy. Parents should have a realizing sense of the necessity for beginning the child's training immediately and of the danger of even one day's delay.

Sleep There should be long hours of quiet sleep for the baby, interrupted only by giving food at regular intervals, by the daily bath or by a change of clothing. Its chief functions now are to eat and sleep and not to furnish a center of interest for an admiring group of relatives. The baby is not a plaything; it is an individual in the process of making and its chances should not be wrecked. If sleep is interfered with at this age the nervous system does not develop normally. About twenty hours out of twenty-four should be spent asleep. During sleep the baby should be turned occasionally to avoid cramped and uncomfortable positions and strained muscles. If the mouth opens while the child sleeps it should be gently closed.

As the child grows older the waking periods will be longer. At two years, thirteen or fourteen hours of sleep may be enough; at three years, eleven or twelve hours. There will be considerable variation in this with different children, some requiring more, others less sleep. In any case, there should be a systematic regularity of bed hours.

From birth to the end of the first year the child should be undressed and settled for the night by six or seven o'clock. After the night feeding at ten or eleven o'clock it should sleep undisturbed until five. During the day it should sleep at first most of the time and gradually less until only a morning and an afternoon nap are needed. Until the end of the second year the child should have a morning nap and should be undressed for it when possible. It may have a short afternoon nap also if this seems needed and does not lead to disturbed sleep at night. Its bed hour at this age should be about seven.

All during the years of childhood the bed hour should be regularly early. Up to the eighth year not later than seven or eight o'clock and not later than nine o'clock until after the fifteenth year. It is sometimes necessary to infringe upon this rule but the occasions should be exceptional. Constant late hours with attendant irregularity of sleep tend to a disordered nervous system. The child should sleep through the night and should rise at once on waking. If sleep is restless or disturbed it is usually due to digestive disturbances and can be corrected by some modification in the diet or some change in the time of feeding. Restless sleep usually goes hand in hand with eating between meals and habitual irregularity of the meal time and the bed hour. It should be looked upon as something requiring immediate investigation and correction.

Exercise

The first exercise which the normal baby takes is a vocal one. Its cry establishes the power of the lungs to do their work. Thereafter a certain amount of lusty crying each day strengthens the vocal chords, the muscles of throat, chest, abdomen and back, and gives the child a good wholesome stirring up of general activities, through an increased circulation of blood. For the first week the exercise attendant upon the daily changes of clothing, occasional turning during sleep and normal crying is sufficient. After this, exercise may be given by wheeling the child in its carriage a few moments at a time several times a day, or by carrying in the arms, by gentle rubbing or massage and by allowing the child to kick and squirm free from all clothing for five or ten minutes at night when undressing and in the morning when dressing. As soon as a child creeps it usually exercises sufficiently by itself. Children should not be encouraged to walk at too early an age as premature exercise of any function is very harmful.

As the child grows older and its exercise takes the form of play, thought should be given to a selection of games and toys. Those should be suggested and chosen which will lead to an all-around muscular development, as balls for arm and shoulder muscles, ladders or bars for the back, and the like. The discovery that play is useful and that games and toys have other than a pleasurable meaning is a new one. Now we know that play is a vital form of exercise for the growing child, so we encourage it and organize it and include it in our school curricula. The playground and the play hour are as important factors in the education of the child as the schoolroom and the daily lesson.

Fresh air

Fresh air is very necessary to the baby. If the weather is warm and the baby is protected from sun and wind it may sleep out of doors during the day time after the first three or four days. If the weather is cold it must be gradually accustomed to the change of air by opening the windows for a short period several times a day. This does not mean that the room should not be well ventilated at other times. By the end of the first month the child should have a daily outing. If well wrapped and rightly protected from cold, from too much light and from wind, the child may spend most of the day out of doors, even in moderately cold weather, and will be all the better for the treatment. This applies to the frail child as well as to the healthy one. Out of door sleeping for children as well as for adults, is now recognized as an excellent curative for the feeble ones and an excellent preventive for the robust ones. The sleeping rooms of growing children should be thoroughly ventilated. In winter time this can be accomplished best by opening the window and tacking a piece of muslin over the opening. The air sifts through and drafts are prevented. If the child does not react to cold, strenuous treatment must be avoided.

Bathing

After the healthy baby is a week old it should be given a daily bath. The bath acts as a tonic to the healthy baby. It is comforted and filled with well being in the present and braced and hardened for the future. The baby's body becomes warm and often moist in its many wrappings and the bath cools and cleanses and relieves. Irritability and fretfulness are sometimes a direct result of a clogged skin and can be quieted only by a good bath. If the baby is feeble or does not react well, the frequency of bathing will have to be regulated according to its endurance, but the body may still be cleansed daily with a dampened sponge. The best time for the bath is during the morning, midway between two feedings, that is, about ten o'clock. It should not last longer than five minutes. The temperature of the water should be about blood heat, 99° F. during the first weeks. This is gradually lowered until at the end of the first year, a temperature of 80° F. is reached. Only good unscented soap should be used in very small quantities and it should be thoroughly rinsed from the body. If left to dry on the body it soon irritates the delicate skin. Corners of the eyes and nostrils should always be washed. During the first year or year and a half the mouth should be wiped out with a swab or soft cloth and the teeth should be cleansed with this. Great care should be given the teeth all during childhood. Teeth decayed through lack of care or disease are a source of danger to the child's health. They should be cleaned regularly at least twice a day. After the child is two years old this is best done with a small soft tooth brush.

Often uncomfortable chafing and irritation result from a neglect of the genitals. These parts should be carefully cleansed each day as irritation due to neglect may result in future bad habits and consequent ill health.

Regularity of intestinal movement

With the healthy baby the habit of freeing the bowels with regularity may be established during the first month or two of life. The child should be carefully supported over the chamber night and morning at about the hour when evacuation usually occurs. The association of ideas is quickly set up and the habit soon becomes fixed. The early establishment of this habit has more than one virtue. It lessens the number of soiled diapers, thus ensuring more hygienic conditions for the household and less work for the one in charge, and it hastens the day when the diaper may be altogether discarded. The same method of training may be applied in teaching the child to urinate regularly or at least to make its wants known.

The infant should never be allowed to pass even one day without at least one free intestinal movement. It may sometimes be necessary to accomplish this with sick or feeble children by giving an enema to soften the fecal matter. Drugs should never be given except under the advice of a competent physician. With artificially fed babies, obstinate constipation is often due to defective feeding and may be overcome by a judicious use of thoroughly cooked oatmeal water. Lack of water may be also one cause of this trouble with babies. The habit of a daily movement once established should be carefully fostered as the child grows older. Time should be allowed for this process as for others. A common cause of chronic constipation in later years is the morning hurry in childhood which may interrupt and destroy the child's regularity of habit. Physical functions are just as important as mental ones. It would be better to miss a few lessons than to make brain and body sluggish with retained wastes.—[*From a pamphlet of the New York State Agricultural College, Cornell University, sent free only to those living within the state.*]

VII

CLOTHING THE BABY

FLORA ROSE
New York State Agricultural College, Cornell University.

NOTHING which concerns the baby has been more radically changed in recent years than its clothing. The long heavy betrimmed dresses, with irritatingly stiff ruffles and yards of uselessness have gone; the pinning blanket with its diabolical power of repressing necessary freedom has been discarded. The length and strength of the binder has been limited.

New ideals The ideal to seek in providing the child's clothing is looseness, lightness, warmth and cleanliness. The binder is still worn and should consist of a bias unhemmed strip of flannel 28 inches long and about four inches wide. This binder is easily washed, exerts an even pressure, is elastic and yields to the movement of the child's body, and supports the abdomen without uncomfortable binding. It is pinned in place with small strong safety pins. This is worn until the child's abdominal muscles are strong. It should be kept clean and changed with the rest of the clothing.

The shirt The next garment is the shirt. This should be of fine soft material. The best fabric for shirts is a mixture of part silk and part wool or part cotton and part wool. This mixture shrinks less and hardens less in washing than all wool.

The diaper The diaper is best made of a soft grade of cotton diaper. It should not be too large and have too many thicknesses as it interferes with right development.

A better arrangement is to provide square pads made of soft cotton and easily washed and place these in the center of the diaper before it is pinned on. The diaper should not be so tight as to constrict the child's pelvis and back nor so thick as to spread the bones of the legs. Much harm is done by careless adjustment of this garment. The diaper may be fastened to the shirt with safety pins. Over the diaper and shirt in cool or cold weather should go a flannel slip, in summer one of some lighter material. It should be a simple garment hanging loose from the shoulders and having sleeves. It should be about eight or ten inches below the feet and is more convenient if made by the same pattern as the dress but one-half inch smaller. It is best made from a mixture of cotton and flannel and requires careful washing to keep it soft.

The dress

The dress or slip should be made one-half inch larger in all measurements save length and one inch longer than the flannel slip. It should be made of some soft white cotton material without dressing and should never be starched. The simplest, prettiest and most comfortable baby dresses are made without tucks, without trimming and with soft simple bands at neck and wrist.

Socks

Socks may be used, but if the child's clothing is drawn well around the legs no further protection is needed. Stockings which pin to the diaper are sometimes advocated. The objection to these is, they are often wet with the diaper and must be changed and washed each time, or else they are a source of danger rather than protection to the baby.

Night clothes

Flannel, stockinet and canton flannel make good night clothes. The little night slip should be made in the same plain way as the dress but should have a draw string run in the bottom of the hem. This can be drawn together at night and protects the child's feet against cold during the sleeping hours.

None of the clothing which the child wears in the daytime should be kept on at night. The child should be completely undressed and allowed freedom of limb for a few moments with gentle massage or rubbing and should then have fresh, dry warm clothes, consisting of a shirt, a clean diaper and pad and the night slip. The clothing worn during the day should never be worn at night but should be hung where it will air thoroughly and should be warmed before being put on in the morning.

Laundrying

The clothing should frequently be washed as it absorbs the moisture and secretions from the baby's body and then ceases to be the same source of warmth and comfort. Diapers should not be dried and worn again after wetting. They should first be washed and sunned. No clothing which the baby wears should ever be starched.

The age at which clothing should be shortened differs with the season and the vigor of the child, the present tendency being to shorten the clothes as soon as possible.

Foot gear for first walking

When the child begins to walk and the feet need protection, care should be taken in selecting the foot gear. Soft moccasins with shaped soles and lacing over the ankle are best, as these do not press the foot out of shape. Small strapped slippers or soft shoes made with broad spreading toes and soft soles are excellent. No shoe should be worn which in any way contracts or constricts the foot. A well-shaped foot means much of health and comfort to the adult in later years.—[*From a pamphlet of the New York State Agricultural College, Cornell University, sent free to any one living in the state.*]

VIII

THE INFANT'S FOOD

FLORA ROSE
New York State Agricultural College, Cornell University

Digestive apparatus at birth

NUTRITION is of supreme importance during the first years of childhood. Much of the unnecessary waste of life during infancy and childhood is not due to providence but to wrong methods of feeding. The digestive apparatus of the child at birth is no more developed than the rest of its body. It has never been used thus far and is very delicate and feeble in its action. The stomach is merely an enlargement of the digestive tract and lies almost perpendicular to the rest of the alimentary canal. This explains the ease with which a baby rids itself of any excess of food, or food which causes distress.

Until birth the baby's supply of food has reached it through the blood of the mother. No effort of preparation has been required on the part of the child. After the baby is born it must begin to digest its own food and absorb it through the digestive tract. This does not mean a sudden great increase of growth. The child is only one short stage further on its way toward development. While the new-born baby has some power of digestion, that power is very limited. All its digestive juices are weak and many of them do not appear for some time.

The fundamental needs of the infant for food are the same as those of the adult. The difference lies not in kind but in form and amount. Only those foods which are ready for absorption or require little change can at this period be utilized. It is beyond the feeble power of the baby's immature digestive tract to utilize foods which require marked changes before they are ready for absorption.

Needed food elements and their uses

Proteid is needed to supply the cornerstone for growth and development of all tissues, but it must be in a form adapted to a weak power of digestion. *Fats* and *carbohydrates* must be supplied to meet the demands for energy. But there is only one form of fat which is fitted to the infant and that is fat which occurs in a very finely emulsified form. *Starch* is a foodstuff which requires marked changes before it is ready for digestion. The baby has no power of digesting starch. This power does not develop to any degree until after the end of the sixth month. *Sugar* requires little change, hence this is the form of carbohydrate suited to the infant. *Mineral matter* the baby must have to supply lime and phosphorus and iron and all the other elements which are concerned, not only in building bones and forming red blood and stimulating growth, but which are essential in many different ways. The mineral matter must be in a form best suited to the need for rapid development. *Water* must be present to hold food in solution, and to carry it to the cells and remove the waste products.

Best food for the baby

Nature's answer to the question as to where all these demands are best supplied during this undeveloped period of the child's life is unfailingly "the mother's milk." In the mother's milk the protein is in a form which is very easily digested and yet gives the baby's digestive tract enough work to ensure its gradual development. The fat is unusually finely emulsified and is of a kind which requires little effort to digest. The carbohydrate occurs as milk sugar, almost ready for absorption, and is not so sweet as to vitiate the child's taste for bland food later on. The mineral matter present is very available to the human infant.

When we come later to a discussion of the composition of milk other than human milk and of the various patent baby foods on the market it will be readily seen that any form of food other than mother's milk must be regarded as abnormal for the very young baby, and as likely to involve it in serious difficulties. Hence every effort should be made by the mother to nurse her own child even if this method of feeding cannot be continued during the entire nine months or year.

During the first two or three days after the infant is born no milk is secreted by the mother's breast. A thin watery fluid called colostrum is secreted, which is believed to have a distinctly laxative property and which thus aids in cleansing the baby's intestinal canal of the mucous which has accumulated there before birth. The child should be put at the mother's breast as soon as the mother has recovered from the fatigue of labor, about six or eight hours after birth and every two or three hours thereafter when the mother is awake. This helps to establish the flow of milk, it aids in closing the uterus and probably gives the baby some water. It also establishes the ability of the child to suck. No other food should be given. Nature seems to have intended to give this time to establishing a natural supply of food and it is dangerous to experiment unless under the advice of a physician who understands thoroughly the essentials of infant feeding. The old fashion of making a "sugar rag" or a "flour ball" and giving it to the new-born baby must be strongly condemned. It puts into the child's stomach some entirely foreign substance and is a fertile source of colic, and it diminishes the sucking activity and consequently withdraws this stimulus to milk secretion, thus causing delay in flow of milk. If the milk is slow in coming, the following mixture may be given after the third day every four hours, alternating it with the breast: Whey, two teaspoonfuls; water, two teaspoonfuls; milk sugar, 1/4 teaspoonful. This should be stopped as soon as the milk supply begins.

Water

As soon as the child's eyes and nostrils have been cleaned it should be given a teaspoonful or two of warm sterilized water either from a spoon or a nursing bottle. A little warm water should be given at intervals during the day all during the nursing period. Babies frequently suffer grievously from thirst and are given an irregular meal to supply this demand. The child needs plenty of clean, sterile, warm water given between feedings to keep the kidneys active and the body in good condition. Yet many mothers never think of giving the baby so simple a remedy as a drink.

Regularity of meal hours

From the day the baby is born it should be fed at regular hours and at regular intervals. Time should be given after each meal for the food to digest and the stomach to rest. It is a common sight to see little babies of a few weeks or a few months old, fed at all hours and at all times. The child cries and the mother has learned that feeding it will cause temporary relief. It is a very fatal mistake. The child is, as a rule, not crying because it is hungry, but because it is thirsty, or because irregular meal hours and constant feeding have upset its digestion and colic has resulted, or because it is sick or uncomfortable. First determine the cause of the irritation. Find out whether it is due to colic, to indigestion, to thirst, to uncomfortable clothing, chafing, pins, cold or heat, or the beginning of some illness. Do not make things worse by feeding the child. If the trouble is due to indigestion, the amount of food is to be decreased and not increased and a longer time must elapse between feedings. A drink of warm water will often relieve the irritation. If the trouble continues, a good physician should be consulted who will be able to judge whether or not medicines should be given.

For the first six weeks the baby should be put at the breast every two hours in the day time from 5 a. m. until 11 p. m. It should then remain quiet until the following morning, allowing six hours of undisturbed rest for both mother and child. For the first few days another night feeding may be necessary until the child learns to rest quietly without the extra food, but this should be discontinued as soon as possible. Gradual lessening of the amount of food given at this extra feeding and a little patience will quickly accustom the child to adjust itself to this schedule. Common sense must always govern the planning of any schedule. In some cases where the child is very robust and the mother's milk is rich, these intervals are too short and the number of feedings too many. The main point is absolute regularity whatever the schedule. The schedule will have to be adjusted to the child. If the child is asleep when its meal hour arrives it should be wakened for the first few days. If this is done, it will very soon become accustomed to awaken with a clock work regularity.

From the sixth week to the third month the nursing intervals should be gradually increased to three hours, giving seven feedings between 5 a. m. and 11 p. m. inclusive. If it is possible to avoid it no night feedings should be given at this time. By the sixth month six feedings should be enough for the average child and by the end of the year, five.

Irregularity of feeding not only affects the child directly by interfering with its powers of digestion, but it affects the quality as well as quantity of the mother's milk by overworking the milk-producing glands. One cause of failure in the mother's supply of milk is due to habitual irregularity in feeding the child.

Length of time of nursing

About twenty minutes should be given to each nursing. If the time is shorter than this it usually means that the milk flows too freely and that the quick feeding may result in digestive disturbances. Under these circumstances the flow of milk should be controlled by pressure of the nipple between the fingers. If the child falls asleep while nursing it should be awakened and kept awake until it has finished the meal. The contents of one breast should be sufficient for a meal, especially with younger babies, and the breasts should be alternated. As the child grows older, or if the yield of milk is not large at any one time, it may be necessary to give both breasts at a meal. After the child has been fed it should be placed in its crib on the side which has been uppermost during the nursing. This rests tired muscles and ensures better sleep.

Care of the breasts

Indigestion in breast-fed babies is sometimes caused by a lack of care of the mother's breast and of the child's mouth. Before and after each nursing the nipples should be washed with a dilute boric acid solution and rinsed with fresh water. The baby's mouth should also be cleansed by wrapping a little soft cloth or cotton around the finger and swabbing out the mouth with clean water. Milk left on the nipples or in the mouth of the child may sour or become otherwise contaminated and cause as much trouble as unclean milk from any source. The milk which accumulates in the milk ducts is often contaminated and it is often best to withdraw a little of the milk before nursing the child.

The nursing mother's food

The general health and nutrition of the mother affect the composition and quality of the milk. Often a scanty supply can be increased, or the ratio of the different ingredients changed by a change in diet, in exercise, or in general hygiene.

The diet of the nursing mother should be much the same as it has been during the nine months previous to the birth of the child. It should be rich in milk, eggs, well-cooked cereals, vegetables and fruits. Meat should play an unimportant part, unless the mother has been accustomed to a large meat diet. Under these circumstances the withdrawal of this stimulating food may be unwise. Strong vegetables, as onions and turnips, which produce flavors in milk, should be avoided. Liberal use may be made of such fruits as apples (which are often better cooked as they are more easily digested), oranges, prunes, ripe peaches and pears. The belief is a mistaken one that fruit in the mother's diet is a cause of colic to the baby. Constipation and the general bad condition resulting from a diet deficient in bulk and in the mineral salts provided in fruits and vegetables is much more to be feared. If there is any tendency toward constipation the diet should be a laxative one such as has been previously suggested.

Weaning

The age at which a child should be weaned will have to be determined by a number of things, such as the vigor of the child, the richness and quality of the mother's milk, teething conditions, season of the year. Normally the child should be weaned at least within the year, for by this time the average milk has become insufficient to meet all the needs of the growing organism. It is not wise to wean a child just at the beginning of summer or during the hot weather. It should be accomplished earlier or should be held over until fall. Prolonging the period of breast-feeding beyond the normal time may be as bad for the child as any other wrong method of feeding. Weaning should be accomplished gradually unless the child refuses other food as long as it is kept at the breast. Two or three months may be allowed for it, beginning at first with only one modified milk meal a day and gradually increasing the number. The last nursing to be dropped should be the one at night. The change from the breast to cow's milk must be made carefully to avoid any disturbance which may arise from the difference between the two foods. Cow's milk is rarely given at this time without dilution and it must be more diluted than for a child of the same age who has been artificially fed from birth. The milk mixture to be substituted at this time will be considered in the second part of this bulletin under the head of artificial feeding.—[*From the New York State Agricultural College, Cornell University, sent free to any one living within the state.*]

IX

WHEN THE MOTHER CAN NOT NURSE HER BABY

FLORA ROSE
New York State Agricultural College, Cornell University

Dangers of artificial feeding

ALAS for the baby deprived of its natural food supply! With all our accumulated knowledge of foods and our improved methods for making the artificial approach the real, we have not been able to find or manufacture a food that can supply the baby's needs in the same perfect way that they are supplied by the mother's milk. Experience has shown that even with skilful supervision the artificial feeding of a baby may be attended by results as serious to its health as a severe illness. If this is true, what disaster may follow when there is no knowledge of child feeding and the baby becomes the victim of untutored experimenting? This peril is impressed upon us when we read such statements as the following: (1) "The death rate among artificially fed babies is seven to ten times as great as among those fed from the breast"; (2) "breast-fed babies have a greater possibility of developing into healthy childhood than artificially fed ones"; (3) "one-third of the babies die before the end of the third year, and 85 per cent. of these are bottle-fed."

In the face of this evidence it is our duty to become familiar with the conditions that will give the best possible chance to the unfortunate "bottle-fed" baby and to protect it with all the knowledge that science has brought to bear on the subject. This knowledge is now within the reach of all, as each year sees an increasing number of good books, simply written, on the care of the child.

Artificial feeding

When the baby's natural food is denied it, the question of finding a substitute that will give good results becomes urgent. Too often the only guide to a choice is the advertisement that goes with a patent food. The worried mother tries first one brand, then another, in a frantic attempt to find something which will "agree" with the baby. Sometimes we hear of a successful result, but the failures are sadly marked. This is not the time to rely on the word of those having a commercial interest in selling a particular patent food. Now, only expert advice and the word of those physicians and scientists who have spent a lifetime in exploring this field should be considered. What is the opinion as expressed practically unanimously by these persons? *That the food which gives the best results when babies must be fed artificially is the milk of some other animal.*

Whatever the source, milk is a natural building material for such tissues as the baby's. When the mother's milk fails, or is not available, an intelligent effort should first be made to use the milk of some other animal. Undoubtedly there are serious difficulties to interfere in the use of cow's milk as a substitute for the baby's natural supply, but an understanding of these difficulties will enable us in most cases to overcome them. We must remember that the difficulties in using foods other than milk are greater than those in using milk.

Nature has adapted the milk of each animal to meet the particular needs of its young. The new-born calf is a relatively strong and well-developed animal.

Its muscles are comparatively vigorous and its powers of digestion are fairly active. In a very few hours it must lead a semi-independent existence and in a very few weeks it must shift for itself. Cow's milk is a strong food that stimulates and develops but does not overtax the digestive powers of the sturdy calf.

But the new-born baby is more frail and helpless. Its muscles are weaker, its powers of digestion relatively feebler, its period of dependence longer. Human milk is a weak food, requiring comparatively little effort to digest, and it is perfectly suited under normal conditions to the lagging activities of the baby.

In using cow's milk to feed the baby, a part of the problem, therefore, is to adapt the food of a naturally vigorous animal to a naturally less vigorous one. To accomplish this, cow's milk must be modified or changed to make it more like human milk. Milk thus treated is known as modified milk, and it has become an important factor in the artificial feeding of infants.

Clean milk

A very important factor in suiting cow's milk to the baby's needs is the question of cleanliness. Mother's milk is delivered directly from the "producer to the consumer." There is little time or opportunity for it to become contaminated in passing from the mother to the child. Cow's milk, on the other hand, is frequently produced under very unclean conditions and is liable to careless and dirty handling before it reaches the baby. Hours, or even days, may elapse before it is used as a food. During this time it may have become contaminated in one of a dozen ways and may finally be unfit for use. Many deaths among babies and little children may be traced directly to the use of unclean milk. Milk not quite fresh, and a little dirty, is a very common cause of a baby's trouble in using cow's milk.

Milk modification

Cow's milk can be so diluted and modified as to make it resemble mother's milk very closely in composition, but no known process of modification can make the two alike in all respects. The two differ not only in composition, but also in other characteristics. The following table will serve to show the external differences between them:

COMPARISON OF HUMAN MILK AND COW'S MILK

	In 100 Parts of Milk				
	Water	Protein	Fat	Milk sugar	Mineral matter
Human milk	12-13	1.50	4.00	6.50	0.15
Cow's milk	13-14	4.00	4.00	4.50	0.70

Cow's milk not only contains more than twice as much protein, but the protein is largely of a kind called casein, which may form a relatively firm curd when it reaches the stomach. This curd is a good developer for the calf's active stomach muscles, but it is not so well adapted to the needs of the baby, whose natural food contains but little casein and demands no such effort to digest it. The fat in the cow's milk is in larger particles, or globules, than that in human milk, and it is therefore more difficult to digest. This difference in the two kinds of fat is now believed to be a frequent cause of the child's difficulty in digesting cow's milk. There are just as distinct, though less easily explained, differences in the mineral content of the two kinds of milk.

All of the foregoing factors, combined with the possibility of dirty milk, make more difficult the artificial feeding of the baby even with skilfully made modified milk mixtures. They are mentioned here to show that artificial feeding must ever be regarded as unnatural and that the baby thus fed must be treated with double care.

No matter what method is used in making modified milk mixtures, the underlying principle is the same; that is, to dilute cow's milk so as to reduce the amount of protein present until it is about the same as in mother's milk, and then to increase the food value of the diluted mixture to normal by adding sugar or sugar and cream. Which method is best, it is impossible to say, and there is not space here to include a description of all of them or to enter on a discussion of their respective merits. Every family in which there is a baby should own one or more good books that treat on the care and feeding of children. If the child must be bottle-fed, the choice of method may then be made intelligently.

Most methods of modifying milk are rather complicated and difficult to manage. The following is recommended for its simplicity and is given here by the courtesy of the Babies' Dispensary and Hospital of Cleveland, Ohio:

Bottle feeding

1. "The only good substitute for mother's milk is milk from healthy, consumption-free, clean-kept cows, milked in a clean stable by clean milkmen into sterilized cans, quickly cooled over sterile refrigerators and poured into sterile bottles, which are closed with sterile stoppers, *and kept cool till used for the baby.* Such milk need not be sterilized or boiled. Common store or milkman's milk is no food for the baby, even though it may taste and look good. The patent baby foods, condensed milk and the like, also harm the infants in most cases, and should therefore

not be used. *Your doctor can tell you how to get the right kind of milk for your baby.*

2. "*If you cannot get the best milk,* see that you get as good milk as you can from a milkman whom you know to be clean; *use a clean dish;* unless it is certified milk or clean and pure beyond doubt, *boil the milk from three to five minutes; during the hot summer boil for ten minutes; cool as quickly as possible* by placing the dish in another filled with the coldest water you can get; renew this water frequently and keep the dish covered in the coolest room of the house.

Bottle cleaning

3. "*Clean the bottle* immediately after feeding by first rinsing it with clear water, then soak it in soda, borax, or soap water; clean well with a clean brush and rinse with boiled water; *then set it upside down in a clean place,* or stand it upright filled with boiled water. The bottles are to be boiled as directed below, before being used.

4. "As soon as you have sufficiently cooled the milk, prepare your food as directed by the doctor, always using the *cleanest dishes;* then pour it with a clean pitcher, not through a dirty funnel, into as many bottles as the baby is to have meals, and stopper with clean cotton batting, which you may have baked in the oven. Before using the bottles, however, which you have already cleaned as directed under item No. 3, boil them for twenty minutes and then set them upside down in a clean place or dish to dry and cool.

"Use a nipple which is slipped over the neck of the bottle and which can be turned inside out; *nipples with tubes* are convenient for a lazy mother, but mean *death to the baby. Cleanse the nipple* thoroughly, outside and inside, after each feeding and keep it dry in a clean covered cup or glass. Boil the nipple at least once daily.

Frequency and quantity of meals

5. "*Feed the baby*:

"*First Week.*—Seven meals in 24 hours; each meal from 1½ to 2 ounces (45 to 60 grams), consisting of 1 part milk and 2 parts water or thin gruel, and 1 even teaspoonful of granulated sugar for each 2 ounces or 60 grams of the diluted mixture."

(Boil the water used in making milk mixtures.)

"*Second Week.*—Six meals in 24 hours; each meal from 1½ to 3 ounces (75 to 90 grams), consisting of 1 part milk and 2 parts water or thin gruel, and 1 even teaspoonful of granulated sugar for each 2 ounces or 60 grams of diluted mixture.

"*Third and Fourth Weeks.*—Six meals in 24 hours; each meal of 4 ounces (120 grams), consisting of 1 part milk and 2 parts water or thin gruel, and 1 even teaspoonful of granulated sugar for each 2 ounces or 60 grams of diluted mixture.

"*Second Month.*—Six meals in 24 hours; each meal of 4 to 5 ounces (120 to 150 grams), consisting of 1 part milk and 1 part water or thin gruel, and 1 even teaspoonful of granulated sugar for each 2 ounces or 60 grams of diluted mixture.

"*Third Month.*—Six meals in 24 hours; each meal of 5 ounces (150 grams), consisting of 1 part milk and 1 part water or thin gruel, and 1¼ even teaspoonfuls of granulated sugar for each 2 ounces or 60 grams of diluted mixture.

"*Fourth to Sixth Month.*—Five meals in 24 hours; each meal of 6 to 7 ounces (180 to 210 grams), consisting of 2 parts milk and 1 part water or thin gruel. and 1½ even teaspoonfuls granulated sugar* for each 2 ounces or 60 grams of diluted mixture.

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*The use of milk sugar in place of granulated sugar is believed by some physicians to be advisable because, first, it is said to ferment less easily, and second, it is considered to have a slightly laxative effect. If milk sugar is used the amounts given above should be doubled. The disadvantage of its use is expense.

"*Seventh Month.*—Straight milk may be given in five feedings of about 6 to 7 ounces each.

6. "Warm each feeding to about body heat before giving it to the child, by placing the bottle in a dish of hot water; hold the baby in your arms while feeding; do not allow the baby to drink from the bottle any longer than 15 minutes at the most; *pour away any of the rest; do not save this for the next feeding.*

7. "*Do not coax the baby to take more food than he wants.* Too large quantities and too numerous feedings harm the stomach and lead to intestinal disturbances. *That's what makes the baby cry so much; not, as mothers think, insufficient food. Do not overlook a serious illness because the child is teething; for teething very rarely makes the baby sick.*

8. "From the seventh month on, give one meal of broth daily. From the eighth month, give two to three tablespoonfuls of strained oatmeal, rice, tapioca, farina, flour soup, zwieback, daily. From the tenth month on, strained apple sauce, prune juice, orange juice.* *Never give the baby more than five meals a day all in all.*"

Modified milk mixtures must always be used with common sense. Directions are given to serve as guides and are not infallible rules. If a child digests its food well but shows too great symptoms of hunger between meals, increase the amount given at a meal. If the child is not hungry at meal times increase the intervals between meals. There will be many similar points of adjustment to be made, for no schedule can be absolutely perfect for all cases. Cleanliness, accuracy, and regularity can and always should be observed.

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*If the baby is fed with boiled milk, a teaspoonful of strained orange juice, diluted with 2 to 4 times its amount of water, should be given between feedings, several times a day.—Author.

Food diluents

The question is often asked, which is best to use in diluting milk mixtures, water or some kind of gruel. If the baby suffers habitually with constipation, a thoroughly cooked thin oatmeal gruel should be used in place of water to dilute the milk. Barley gruel is also somewhat laxative, though less so than oatmeal. Rice water may be used when there is a tendency to looseness of the bowels. The use of barley or oatmeal is advisable in cases in which the milk seems to cause slight indigestion. Many physicians believe that it is always better to use a thin gruel instead of water as a diluent, because the thickened starch aids in breaking up the curd which cow's milk forms when it reaches the stomach, and thus helps the baby to digest the milk. If gruels are used they should be carefully made, very thoroughly cooked and strained, and should be rather dilute.

Barley water or gruel.—To 1 quart water add 1 tablespoonful well-washed barley. Boil very slowly for several hours or until reduced to 1 pint. Strain and use. If too thick, dilute with a little water that has been boiled.

Oatmeal water.—To ½ cup rolled oats add 1 quart water. Boil slowly two hours. Strain and use. If too thick, dilute with a little water that has been boiled.

Rolled oat jelly.—To 1 cup rolled oats add 3 cups water. Cook two hours or longer in a double boiler. Rub through a strainer. The coarser part may be reserved for use by the adult members of the family.

Indigestion

If the baby suffers from indigestion, for a day or two, give it a milk mixture suited to a younger child and then increase the strength gradually meal by meal.

Premature weaning If the baby is prematurely weaned, begin by feeding it with a milk mixture suited to a younger child, and increase the strength of the mixture, meal by meal, and day by day, as fast as the baby can bear it without showing symptoms of distress. One of the essentials to success is that the child's intestinal tract should come gradually to adjust itself to digesting cow's milk.

When a baby is weaned at the normal time, the milk mixture used to replace mother's milk should at first be much more dilute than the usual mixture required for that age in artificial feeding. The strength of the mixture to full cow's milk should then be increased as rapidly as the baby can bear it. Gruels should be used to dilute the milk at this time, for the baby will have established its power to digest starch and the gruels will have an actual food value as well as being of use to break up the curd.

Peptonized milk Sometimes even the most careful efforts to feed a baby with modified milk fail. It may then be necessary, partly or completely, to predigest the milk with pepsin. This is a very simple process. A given amount of the digestive substance, pepsin, is added to milk and the milk is kept at about body temperature for five to thirty minutes, according to the completeness of digestion desired. It is then chilled as soon as possible to stop further digestion. Predigestion of milk must be carefully considered. It means carrying on outside the body a process which normally should occur within the body. If it is kept up too long the child's powers of digestion may become weakened by having too little work to do. Therefore the milk should be slightly less completely digested, day by day, until the child learns to do its own work. Directions for peptonizing milk are given with the powders or pepsin purchased for that purpose.

CHARITY

After the Painting by Paul Dubois.
In the Art Institute of Chicago.

Sterilized milk

If the milk supply is at all doubtful, milk should be either boiled or pasteurized. Pasteurization is the name applied to a process of heating milk for a given length of time at a temperature below the boiling point of water. Milk is less changed by the action of this lower temperature than by boiling, and generally pasteurization is sufficient to make the milk clean and wholesome. If milk is to be pasteurized, the easiest way is to mix the milk, water, and sugar for the entire day's feedings previous to heating the milk, fill the bottles, which have been sterilized by being boiled, stopper with clean absorbent cotton, and set on a rack in a boiler or deep kettle with sufficient water to come to the level of the milk in the bottles. The water should be kept at a temperature of 145°-155° F. for forty-five minutes. A dairy thermometer may be used for regulating the temperature. At the end of this time the bottles should be removed, cooled quickly, and put away in a cold place until ready for use.

It is a much discussed question as to the effects which cooking has upon milk, but the consensus of opinion is that milk thus treated loses some of its desirable properties. While this may not be of great importance when milk is only a part of the dietary, as with older children and grown persons, it is of considerable importance to the baby living entirely on milk. When sterilized milk must be fed, it is believed to give better results if a teaspoonful of strained and diluted orange juice is given between feedings several times a day. The freshness of the orange juice is believed to counteract in part the harm done by sterilization. An effort should be made to procure milk produced under such clean conditions as to make sterilization or pasteurization unnecessary.

Patent foods

Little has been said so far concerning the use of the various patent foods on the market, save that they cannot compete successfully with carefully made milk mixtures in substitute or artificial feeding.

The baby should have its carbohydrate in a soluble form like sugar, for it has little power to digest starch until about the sixth month or later. Some of the patent foods contain, as their chief foodstuff, unchanged starch, and as this is not available to the baby, the child may actually suffer from tissue hunger although the stomach and intestine are full. To give best results, the baby's food should contain fat in a finely divided, easily digested form. Many of the patent foods contain little or no fat. Perhaps the strongest case against the patent foods is their lack of the foodstuff known as mineral matter or salts, which is so essential to healthy growth and development. Many cases of malnutrition result directly from the use of such of these foods as are deficient in fat and mineral matter. A common ailment among babies thus fed is rickets, an ailment that is serious and may be lasting in its effects.

When a patent food is made with milk, its bad effects are minimized and it may serve a useful purpose. As has already been pointed out, barley and oatmeal are much used in place of water to dilute milk mixtures. They help to break up the curd formed from the casein of the milk during the process of digestion. Some of the patent foods act in the same way and this is one of the secrets of their success. Occasionally a patent food used without milk is of value to tide the baby over a period of indigestion, to help when a trip is to be taken and fresh, clean milk is not available, or to take the place of the mother's milk during a brief temporary illness of the mother. On the whole, however, canned milk and patent foods used without milk should be last resorts. They may make a fat baby, but fatness does not mean development of muscles, bones, and nerves, or assurance of vigor and endurance.

Use of solid foods

If a child has been bottle-fed, the use of semi-solid or solid foods begins somewhat earlier than with the breast-fed baby. Wise care should underlie this use of solid foods and the baby should not participate in the family dietary, as so frequently happens, just because milk is no longer its sole maintenance.

Care in preparing foods

The cereals given to the baby should be very thoroughly cooked. Many times failure to make children like cereals is due to improper cooking. The half-raw cereal has an unpleasant taste and causes indigestion. Package directions should not be depended on; they are given to tempt us to save time. Even partially prepared cereals, as rolled oats, when served to very small children, should be cooked 1½ to 2 hours. A fireless cooker will make this both easy and cheap to accomplish and every family can afford at least a home-made cooker. Vegetables should be carefully prepared so as to keep them mild and delicate in flavor. At first they should be strained or rubbed through a sieve to remove all lumps or hard pieces.—[*From a pamphlet of the New York State Agricultural College, Cornell University, sent free to anyone living in the state.*]

X

THE DANGER OF UNCLEANLINESS

Uncleanliness of earth

MOTHER Earth is cleanly in her instincts. If we let her have a decent chance, all impurity committed to her is rapidly made clean; but if we overburden her by pouring an excess of filth out upon the surface of the soil, or into the soil, on or about the spot which we call home, we do that at our peril. The dangers of so doing are of two kinds:

First. In the soil which is overburdened with the filth of slops, sink drainage, or soakage from outhouses, harmful and dangerous gases are formed. They pollute the air which we must breathe, and, worst of all, our houses, heated artificially, act as a huge suction pump drawing these gases into the cellar and up into every room of the house. Absolute proof has been obtained by careful experiments that gases liberated in the basement, permeate the rooms on all the floors of a house, no matter how tightly they are shut off from the basement. The gases of decomposition thus formed in unclean ground and sucked into houses, are not a bit less dangerous than is sewer gas. So, observe this golden rule: keep clean the ground around the home and around the school house.

Second. From these same sources of filth, our springs and wells are polluted. The distance through which polluted soakage finds its way to wells, or springs, varies very much with the character of the soil or rock. It sometimes finds its way into wells for almost incredibly long distances. So this again emphasizes the necessity of obeying strictly the rule: keep sources of filth from the near vicinity of the home well or the school well.

Unclean water

There is no reason for wholesale condemnation of the farmer's well or the village well. Properly constructed and cared for, its water is, almost invariably, good and wholesome. But many well waters which are clear and sparkling are nevertheless dangerous. In cholera times in London, the people came from far and near to get the water of the Bond Street well because they thought it so good and pure. But the death from cholera of a multitude of people was traced to this well. So the infection of typhoid fever coming from neighboring sources of filth brings typhoid fever and the hearse and the undertaker to many homes every year.

Unclean air

Leave a room or house shut up closely for only a day or two and the air becomes stuffy. Air to remain pure and health giving, must be unconfined. Stagnant air is a menace to health, as are stagnant, filthy pools around the home. The walls of a room are absorptive of evil gases and of particles of organic matter which float in the room air.

With the rooms closed, these walls give up again to the retained air some of its filthiness. But in occupied rooms, the occupants are continually giving off, from lungs and skin and clothing, harmful gases. Lamps, gas jets, and heaters not well managed, are continually spoiling the air. Remembering how potent the outdoor air is in bringing back to health persons stricken with some dangerous diseases, we should take this fact as an emphatic hint that pure air is even more potent and more successful in preventing disease than it is in curing it. And it should nudge our memory to keep the air of our school rooms and our homes, and that about our homes, as pure and fresh as possible. There is good reason why we should loathe filthy air as we do unclean food; for the uncleanliness of the air we breathe sickens more of us and kills more of us than does the uncleanliness of our food. But both are bad and dangerous.

Unclean food The uncleanliness of food endangers us in two ways, as does the uncleanliness of water; (a) by the harmfulness of the uncleanliness itself, and (b) by the infectious matter which accompanies the filth or is transported to the food by it.

(a) The black sediment in the bottom of the bottle of dirty milk is unappetizing and is, undoubtedly, unwholesome, whether the milk is or is not sterilized by heating. The same may be said of the uncleanliness, as mere dirt, which adheres to the bread from the dirty baker or the dirty bakery, or the meat from the dirty butcher or marketman, or the candy from the fly-infested confectioner's shop; but there is another question beside the one of filth itself. Filth and infection are twin demons of evil who often go hand in hand—the chief of those human ills which escaped when Pandora opened her fateful box.

(b) Fed to the babe unsterilized, the sediment in the unclean milk, with its disease germs from the intestinal canal of the cow or elsewhere, may give rise to a dangerous attack of diarrheal disease. The many deaths from infantile diarrhea every year emphasize the danger from filth-borne infection, and not so much the danger from the filth itself.

Again, through unscreened windows and doors, the summer fly, on his way from dirty places, dots our food with filth. This filth often leaves the germs of typhoid fever or other infectious diseases upon our food. Milk, boiled potato, and various other foodstuffs, are excellent culture grounds for the rapid multiplication of these disease germs. Thus, dirty food becomes infectious food, and there is good reason to believe that many of the cases of typhoid fever are caused by flies.

Again, a careless person caring for a patient with typhoid fever, diphtheria, or tuberculosis, may carry on her fingers, which have not been carefully washed, the infection to the food which she prepares for herself and others. These are some of the ways in which unclean food may endanger or destroy us.

It should be remembered, always, that the unclean earth beneath and around our homes, unclean water, unclean air, unclean food, unclean houses, and unclean persons, are serious dangers to health and life, and that the training of ourselves into systematic habits of overcoming these evils is only a reasonable and necessary kind of insurance against the immense trouble, cost, and sorrow which we are so often called to pay for our neglect of these important matters.

So let us practice and preach the gospel of cleanliness—personal cleanliness, domestic cleanliness, and municipal cleanliness.—[*From a bulletin of the Maine State Board of Health.*]

XI

THE CARE OF THE BABY*

(A Reference Paper)

THE BABY'S HOME

BEFORE deciding to move into a house, go over it from the roof to the cellar and notice these things:

1. Is the cellar clean and dry?
2. Is the toilet clean and in good condition?
3. Does the water run freely out of the faucets and in the toilet?
4. Is the wallpaper and plaster dry and clean?
5. Is there plenty of sunlight in the rooms?
6. Do the surroundings furnish pure air?
7. Is the water supply safe?
8. Is there a place for children to play?

CARE OF THE MOTHER BEFORE THE BABY IS BORN

There are certain rules every woman ought to follow if she wants her baby to be born well and strong.

If her work has been very heavy, she should not work as hard as usual. If she has plenty of idle time, she should take much exercise. Lack of exercise is equally as bad as overwork.

She should try to get plenty of sleep, at least nine hours every night.

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*(The signed articles in this chapter, with the exception of Dr. Hurd's, are used by the courtesy of the Chicago Department of Health, and the Domestic Science Department of The New York State College of Agriculture. The unsigned sections were contributed by the Philadelphia Board of Health and the Youth's Companion.)

Both day and night she should have fresh air in the rooms, and walk out of doors as much as possible.

During the nine months she should be careful what she eats. Her meals should be regular. She should eat wholesome, well-cooked food, and avoid such things as beer and liquors, drinking but little tea and coffee.

She should drink plenty of water between meals that she may avoid trouble with the kidneys.

She should have her urine examined often, as when taken in time, trouble with the kidneys can be cured; but if neglected, it is very dangerous.

Tight clothing worn by the mother is dangerous, not only to her own health, but to that of the unborn baby. The child may be so deformed from this cause, as to be helpless or even imbecile.

Wet feet and damp skirts are dangerous and the mother must try to dress warmly.

Miscarriages are caused by lifting heavy things, running up and down stairs, sudden jolts, etc. A miscarriage is harder on a woman and more dangerous than a regular birth and may prevent her having living children.

The mother should remember that the little child she is carrying depends on her for its life, and that anything that is bad for her will hurt the baby, too; so, for the baby's sake, the mother should be more careful of her body than ever before.

THE CRIME OF ABORTION

ANNA HURD, M. D.

A physician would define abortion as an interruption of pregnancy during the first three months, but the term miscarriage, which is in more general use, except by physicians, means the loss of an embryo child at *any time* during the nine months of pregnancy, previous to full term.

This loss of the embyro child may be brought about in many ways—ill health of the mother—severe acute fevers or any wasting disease may be the cause. Occasionally there exist diseases or deformities on the part of the mother that would cause danger to her life in carrying the child to full term or in giving it birth; in such cases, a physician is justified in using some means to empty the womb in order to save the life of the mother, but the necessity must be plain. The womb is a patient organ, and will bear much abuse, but it is loth to part with the embryo child. It is the mother organ, devoted to the new being which it nourishes, and the danger of changing the natural order is great. Abortion becomes a crime when it is brought about by mechanical or other interference or any act on the part of the mother, or any other person, or by the use of any drug with the intent to bring about the death and expulsion of the embryo child.

A false idea prevails among many that there is no *life* until by motion of the embryo, the mother is made conscious of life, and hence, it is not a crime to produce abortion before that time. Let it be clearly understood that there *is life* from the first moment of conception. *Nothing grows without life.* The embyro child grows every moment of the nine months it remains in the mother organ, and it is murder, foul murder, to cause its death, and the law considers it a crime punishable by imprisonment.

One would not take a troublesome child to a physician and ask that he kill it. That would be considered the act of an insane person, but it is no worse than to ask the physician to kill and dispose of the embryo child in the uterus or womb. The physician who yields to the plea in either case is liable to the severe penalty of the law. Any woman or girl who practices upon herself *any means,* mechanical, by use of drugs, or anything from the use of which she hopes to bring about an abortion, is guilty of murder and so recognized by the law. In many states the law makes it a criminal offense also for any woman or girl to go to a physician and request him to produce an abortion. Death is often the penalty paid by the woman, and if not death, that which may be worse than death, any one or more of the long list of diseases common to women. Abortion is opposed to nature's laws. Any violation of nature's laws brings its sure punishment; better one-half dozen children than one abortion.

Failure to understand the enormity of the crime and its legal aspects, is doubtless a great factor in its wide prevalence; the physician hesitates to appeal to the law to incriminate his patient. Naturally there is much sympathy for the young and innocent, who have been betrayed and find themselves on the way to become mothers, but no pity should be wasted upon those old enough to realize the crime—especially upon married women—the strong arm of the law should deal with such as these. Every man and woman who begets a child should be compelled, the woman to bear and care for the child, the man to provide for both—every violation of the law to be met with its just punishment.

Lack of education in matters of sex, ignorance of nature's laws—that should be the common property of all—doubtless lies at the root of all as a primary cause. Parents have failed in this, their highest duty. They allow their children to come to maturity and pass out into the world and its temptations, ignorant of all sex matters, save such as may be gleaned from low associates. This is wrong—a crime—sex education rightly given would safeguard the young.

Every instinct of the true woman's heart, every thought regarding her own future health and happiness, should warn against the awful crime of abortion. Neither should we minimize the sin of the man; he is equally guilty, often more guilty, if the girl is young and inexperienced. He often proposes abortion and leads the way to its accomplishment; but society unjustly shields him while it condemns his victim, makes an outcast of her and courts him! Let us *demand* the single standard of morality!

THE COMPOSITION AND MAKING OF THE YOUNG BABY'S BED

During the first two weeks of its life, it is desirable that the baby should sleep in a separate room from the mother. The mother needs uninterrupted rest and this cannot be obtained when the baby is in the same room with her.

The most convenient bed for a baby is the bassinet. A very good one may be constructed from an oval clothes basket which should be about three feet long. It may be made to look very dainty by covering the sides with white dotted swiss or other thin material. The inside should be padded and fitted with a removable mattress. A rather large pillow will serve at first, but later it is desirable that a hair mattress should be used. Blankets are better than comforters for the little bed as they can be washed easily. If a pillow for the head is used it should be small. Over the mattress and under the sheeting should be a rubber sheet or, preferably, one of stork sheeting. The basket should be placed on a stand or on two chairs. If allowed to be on the floor the baby is in danger of drafts which always are more numerous near the floor. This basket will answer very well for a bed for the baby until it is about eight months old. By that time it is beginning to move around considerably and is in danger of falling out of bed. A crib with high sides is the best for the baby at this age, and may serve as a bed for a number of years. The old-fashioned cradle is seldom used now. The poets used to sing of the mother who sat and rocked the cradle hour after hour, but some way no one seemed to wonder why it took the baby so long to be rocked to sleep. Recently we have come to the conclusion that the constant movement disturbed the nervous system and kept away the "sand man."—[*The Woman's World.*]

HOW TO DRESS THE BABY

Plain clothes are best. They are easy to keep clean, easy to keep soft.

Here is a list of the things every new baby needs.

3 flannel binders (½ yard to 27-inch flannel).
3 shirts, wool or part wool.
2 flannel petticoats.
2 flannel or knitted sacques.
2 pairs worsted socks.
2 dozen small size diapers.
1 dozen large size diapers.
4 slips of white muslin.
1 cloak.
1 warm cap.
1 pair mittens.
1 veil.
2 blankets.

1 box talcum powder.
2 dozen (large and small) safety pins.
2 bath towels.
2 plain towels.
1 box boric acid powder.
1 cake castile soap.

LATER

3 pairs woolen stockings.
3 knitted bands with shoulder straps.
More diapers.

The binder is made of soft flannel 4 inches wide and long enough to go around once and half way again. It should not be drawn tight. When three months old baby may have, in place of the flannel band, a knitted band (with shoulder straps).

For diapers use cotton diaper cloth, which washes easily. Flannel diapers should not be used. They get hard and rough, and keep the baby hot, and may make him sore in warm weather.

The baby should have a flannel petticoat put on over the shirt and then a plain cotton slip or dress.

When the baby goes out in cold weather, he should wear a warm woolen cap and a coat long enough to turn up at the bottom and button, making a bag. This keeps his legs warm. If it is very cold, a sacque or sweater can be put on first. When the baby is in the baby carriage he should be covered with a blanket.

At night take everything off and put on a fresh binder, diaper, shirt and night slip. The night slip should be longer than the day dress and very roomy. In winter flannel or cotton stockinet is good pulled together by a tape at the bottom to form a bag. The clothing given is for winter use; in the summer time the flannel petticoats should be left off and the under-shirt should be made of cotton and the cap of cambric.

HOW TO PREVENT OPHTHALMIA NEONATORUM

(New-born Babies' Sore Eyes)

(Circular of New York Department of Health)

More than 600 of the 6,000 blind persons in the State of New York are totally blind from ophthalmia neonatorum, or inflammation of the eyes of new-born babies.

This disease is always due to an infection entering the eyes of the baby at the time of or shortly after birth. It may almost always be prevented by proper care and early and correct treatment.

If precautions are not taken, and the disease develops and runs its course unchecked, the sight is totally destroyed, often within a fortnight.

FOR *ALL* MOTHERS

Measures to be Taken by the Mother During Pregnancy

All women, during pregnancy, should be instructed as follows: Daily external cleansing should be thoroughly performed with soap and water and a clean wash cloth. Should the pregnant woman have any irritating discharges, or even profuse white discharge, she should immediately consult her physician or the nearest dispensary.

FOR *ALL* CHILDREN *PREVENTION*

Care That Should be Given by the Physician to the Child at Birth to Prevent Ophthalmia Neonatorum

Immediately after the delivery of the head, before the delivery of the body, the eyelids should be carefully cleaned by means of absorbent cotton or a soft linen cloth dipped into warm water that has been boiled or a boric acid (saturated) solution. A separate cloth should be used for each eye, and the lids washed, from the nose outward, free from all mucus, blood or meconium. All cloths should be burned after using. No opening of the lids should be attempted. At this time, also, the lips and nose should be, in like manner, wiped free of mucus, and the little finger wrapped with a piece of moist linen, should be passed into the child's mouth and any accumulated mucus removed by an outward sweep of the finger. As soon after birth as possible the eyelids should be again wiped clean of mucus, and two drops of a one per cent. solution of nitrate of silver should be dropped into each eye.* One application only of the silver solution should be made, and ordinarily no further attention should be given the eyes for several hours.

Each time that the child is bathed the eyes should be first wiped clean, as above described, with the boric acid solution. The hands of the person charged with the care of the child must be washed with soap and dried with a clean towel before the eyes of the child are touched. Everything that is brought near the eyes of the child must be, in every instance, absolutely clean.

The cotton that is used must, in every instance, be immediately burned after it is used. The water, towels, old linen and the cotton that have been used on the mother must, under no circumstances, be applied to the child. The air of the bedroom must be kept as pure as possible, and the linen should never be dried in the sick room.

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*Note by the Editor: This should be done only under the direction of the physician.

WHAT MUST BE DONE WHEN INFLAMMATION OF THE EYES APPEARS

When the lids become red and swollen, and are gummed along their borders, and when mattery discharge is mixed with the tears as the child sleeps or cries, *an oculist or a physician* should be called *immediately, or the child taken to the nearest dispensary*. Each hour of delay adds to the danger. While waiting bathe the eyes of the child every half hour with pledgets of cotton dipped in a solution of boric acid.* Open the lids wide and allow the solution, which should be warm, to flood the eyes and wash out any matter which may have gathered there.

The child should not be fondled, and nothing which has been used about the eyes or face should be used for any other purpose. All of those in the home should be warned of the danger of catching the disease by getting the matter into their own eyes. Do not listen to those who say it will amount to nothing, or to those who say to bathe the eyes of the child with the mother's milk (the milk is a means of spreading the germs of this disease). Such advice is bad; the delay may result in blindness.

CARE OF THE NEW-BORN BABY

DR. EFFA V. DAVIS

More babies are lost during their first month than at any other age. Many are lost through the careless or ignorant handling of those who care for them at that time. The simple but safe care of a baby in its first month of life can be learned by anyone. Put these points down in your note book; they may be the means of saving a baby's life.

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*Boric acid costs little, and may be bought of any druggist without a doctor's prescription.

Keep a new-born baby warm, but do not cover its face with blankets. Babies need fresh, clean air to breathe. Stale house air breathed over and over again poisons and breeds pneumonia, which is very fatal to a baby.

Bathe the baby in a warm room, with oil the first week, or till the cord drops; then use warm boiled water and but little soap. Keep baby's clothes, towels, bath tub or basin separate from the family toilet articles.

Dress the cord in surgeons' cotton and keep it dry and clean. Wash it in alcohol when ready to drop and till well healed. Do not feed the baby anything but its mother's milk without a doctor's order. Do not think it will starve the first three days while the mother's milk is "coming in." Nature knows her own business best and would have provided a larger helping of food for that period if it were needed. Put the baby to its mother's breast three times the first day, six times the second day, and eight times thereafter till the baby, of its own desire, sleeps a longer period at night and reduces the feedings to seven in twenty-four hours.

It is desirable to wean a baby from night feedings as early as possible, both for its own welfare and that of its mother. Give the new-born baby water twice daily—1½ ounces—through a nursing bottle or by cup and spoon. Put away any temptation to give it whisky and water, butter and sugar, cow's milk or sweetened teas that may be suggested. They start the baby all wrong—throw them away!

Keep all the baby's things clean. A city is too dirty in its atmosphere for anything that is intended for a new-born baby to be safe, that has not been first boiled and kept covered from dust.

Boil its drinking water.
Boil its cups and spoons.
Boil its nursing bottle and nipples.
Boil its bath clothes and towels.
Boil its underclothing and dresses.

This boiling process is a little trouble and some small expense, but it is less expensive than doctor's visits and less trouble than a sick baby. Try it. It pays.

See that everything that goes into a baby's mouth is clean. Wash the mother's nipples before and after each nursing with boric acid solution. Wash the baby's mouth once daily with the same. Have regular feeding hours for the baby during the day. Do not take the baby up every time it whines or stirs. If it is not the feeding hour turn the baby over if it wakes and frets a little; ten to one it is tired of lying in one spot rather than hungry.

REMEMBER

New-born babies cry because they are tired of lying on one side and are not strong enough to turn over.

They cry because their lungs need the exercise.

They cry because they are not sufficiently warm.

They cry because they are wet or uncomfortable in their dress.

They cry because they are thirsty.

They cry because they have been overfed or given something improper and their delicate, new digestive organs are irritated by a mild or severe indigestion.

They cry because they are sleepy and want to be laid down and left alone so they can sleep.

New-born babies *also* cry because at times they are hungry, but we must remember *crying* is about all the language of expression they have for all these other discomforts, and we must not jump to the conclusion that the baby is hungry and must be fed every time it cries.

DONT'S

Don't rock them.

Don't feed them every time they cry.

Don't take them up and hold them every time they cry.

Don't let visitors or relatives pinch and poke and boo at them to make them notice or laugh.

Don't let all the children of the neighborhood visit them and kiss them. Fear contagious disease.

Don't take them out into public places where many people congregate, for the same reason.

Don't feed a new-born baby on anything but its mother's milk till the physician in charge gives his permission, no matter how much the mother's milk seems not to agree.

In 1910, in Chicago, for every breast-fed baby that died, fifteen bottle-fed babies were given burial.

THE LANGUAGE OF THE CRY

It is astonishing to observe how little imaginative insight most women bring to bear upon the crying of small infants.

The instructed modern woman knows that all babies must and will cry to some extent, and that it is a normal and healthy form of expression. At the same time, and this is but natural, it is much easier to apply this theory to some other woman's baby. A human mother, whatever her theories, does not like to hear her own baby cry much. Although her beliefs are modern, her uneasiness is distinctly primitive.

Crying is crying, and she does not take pains to learn the "language of a cry"; therefore the crying baby is either fed, or rocked, or searched for a safety pin.

This is not sympathetic treatment. A baby has a multitude of reasons for expressing distress, and is quite clever enough to vary its crying according to its reason. If adults were forcibly fed, or violently jounced up and down, or stripped and searched every time they grumbled, this would be a bad world to live in. Yet this is the treatment meted out to small babies who cannot talk back, or thump the table, or go out and bang the door.

It is the duty of each mother to study her baby's cry as if it were a little foreign language. It is true, she will soon hear the cry which says, "Isn't it about feeding time?" and the one that says, "I wish you would be more careful when you dress me," and the one that simply calls for human companionship; but she will also hear and learn to recognize many others.

The cry for food usually begins as a sort of fretful, peevish whimper, soon rising, as the baby's sense of outrage grows, to a loud, angry protest; but this cry is not in place except at meal times. Sometimes it means that a very smart baby is trying to enforce its will in spite of rules. In such a case the rules must, of course, be kept, but it is only fair to see if thirst is the trouble. A baby has just as much right to a drink of water as any one else, and the drink is just as good for it.

Fretful crying with restlessness at sleeping time generally means overfeeding; the baby is suffering from indigestion, and more food is not likely to be the remedy.

A loud cry, accompanied with squirming and drawing up of the legs, means some sort of pain in the abdomen, and no one could take the explosive cry of anger or fright for anything but what it is.

An incessant little "worrying" whimper often means fatigue and sleepiness. "Don't try to entertain me—just lay me down and shade the light."

Make a study of this little language, and save both yourself and your baby much wear and tear.

WHEN THE BABY SLEEPS

1. A very young baby needs from sixteen to twenty hours of sleep a day. If he is cross and fretful, it very often means he is not getting enough sleep.
2. Never give the baby medicine to make him sleep. Hundreds of babies die every year from soothing syrups.
3. Put the baby to bed in a quiet room with plenty of fresh air.
4. From feeding time to bedtime keep the baby quiet. He should sleep alone. It is very bad for him to be in the bed with older people. See that he is dressed warmly and loosely for the night and that his feet are warm. Until he is at least four years old, every child should take a nap in the middle of the day. Don't rock the baby, and don't give him a pacifier. Don't let him get into the habit of sleeping in a room with a gas or lamp light. If he never forms these bad habits, he will never have to break them.

FRESH AIR IS FREE

Your baby needs fresh air all the time. Outdoor air is best. In fair and warm weather he may be kept out of doors most of the day, and in hot weather most of the day and night, in open places, in the shade, parks, square, or near the water. In cold weather the baby may be out as long as the sun shines. As he can be kept out for a short time only, he should be taken out often.

When indoors, he may lie in a warmed room, but always with one window open at top or bottom.

HOW TO FEED YOUR BABY

1. Never feed the baby just because it cries; it is probably crying because it has a pain.

2. Feed the baby each day at the *same hours.* Watch your clock.

3. In the first four weeks feed every two hours; then up to three months every two and one-half hours; and after this every three hours. This is for the day time, including the last feeding at 9 or 10 in the evening.

4. During the night after this hour, feed twice in the first four weeks; once from four weeks to four months, and usually none after this.

5. If the baby is well, yet always spits up milk after feeding, he is probably getting too much. If he seems never satisfied, he is probably getting too little. But it is most important *to be sure about this,* and the only method is *to weigh the baby regularly every week,* using scales which show ounces.

BREAST FEEDING—ITS VITAL IMPORTANCE

DR. JOHN M. DODSON

In the last quarter century considerable progress has been made in the artificial feeding of infants.

Unfortunately, the impression seems to be growing that the newer methods are so perfect that the baby can be weaned at any time, that the "bottle" is as good as the "breast."

Nothing could be farther from the truth. Among the many facts we have learned about artificial feeding, one stands out above all the others—"There is no adequate substitute for mother's milk." Thirty thousand infants perish annually in Germany of cholera infantum—more deaths than the dreaded Asiatic cholera has caused in sixty years. Over 90 per cent of these babies are bottle-fed; 96 per cent of the deaths from infantile diarrhœa in London are among the babies who are bottle-fed. Thousands of infants die annually in Chicago just because they are deprived of mother's milk.

The mother who has no breast milk for her child commands our deepest sympathy. The mother whose poverty prevents her nursing her babe should be helped to do so by public aid or private beneficence. Nothing else she can do is so essential to the welfare of the state as that she nurse her child. The mother who can nurse her baby but will not do so because it interferes with her social and other pleasures is guilty of a neglect that is little short of criminal.

The cry of the baby for mother's milk is a plea for its life and often nothing else will save the life.

Give the baby mother's milk; God pity the baby who cannot get it.

BABY'S MILK

DOCTOR A. C. COTTON

Every expectant mother should study carefully the subject of baby's milk.

Breast milk is the only perfect food for babies. All others are unnatural makeshifts.

An infant removed from the breast becomes at once a pathological problem.

Good breast milk may be temporarily spoiled by bad condition of the mother from overeating, lack of exercise and fresh air.

A poorly fed, overworked or worried mother rarely furnishes a good supply of wholesome milk.

If the mother who wilfully aborts be guilty of a crime, what shall we say of her who deliberately endangers the life, health and future possibilities of her baby by taking it from her breast?

Do you realize that of every 100 babies who die of summer complaint, eighty-five are bottle-fed, while only fifteen are breast-fed?

Even though the breast milk be scanty, save it as you value the baby's life and health. One swallow at a feeding may help to digest the artificial substitute. In such a case do not alternate the nursing with the bottle feeding, as that will dry up the breast. Nurse regularly all the breast will yield and immediately give the prepared bottle as a dessert. If baby cries between feedings, give boiled water.

Many babies will die this summer for want of natural food (breast milk). More will die because of poisoned food, contaminated cow's milk. Many will be saved if given certified milk, the cost of a cigar and a glass of beer. Remember this at the funeral.

Germs which sicken and kill babies grow rapidly in milk unless it is kept very cold on ice. Every time the bottle is opened more germs may get in. To head them off take the cold bottle from the milkman's hands, wash and dry the outside and put it on ice.

Wash your hands well before removing the stopper with a boiled fork. Do not breathe upon the milk. Stir or dip with a boiled spoon. Pour into boiled feeding bottle. Add boiled water or gruel which has been in a covered Mason jar on ice. Replace the stopper immediately and return to the ice.

Boil the rubber nipple daily and keep in soda solution. Warm the bottle just before feeding by standing it in a cup of hot water. Do not put the nipple in any mouth but baby's. Immediately after baby's meal empty and clean the bottle. Scald again just before the next meal.

Protect baby against cats, dogs, flies, other children and your own carelessness.

A FEW SIMPLE RULES TO FOLLOW ABOUT BOTTLE FEEDING

1. Don't consult your neighbor, but go to a doctor and learn from him exactly how to make the milk mixture. What is good for your neighbor's baby may not suit yours.
2. Buy enough bottles for all the feeding for a day. If you cannot afford so many nursing bottles, use new fruit jars, sealed.
3. Prepare the baby's food for one day at one time, as soon as possible after the milk comes.
4. Always wash your hands before handling a milk bottle, and wash off the mouth before removing the cap.
5. After filling each nursing bottle, cork it and put the bottles in the ice chest.
6. Warm the bottle in hot water before each feeding. Do not put the nipple in your mouth.
7. Hold the baby in your arms when giving it the bottle. Allow fifteen or twenty minutes for feed-

ing, and see that the milk is taken steadily, but not too fast.

Throw away any milk left in the bottle. Do not warm it over for the next feeding.

CARE OF THE BOTTLES AND RUBBER NIPPLES

New nipples should be boiled for five minutes. After a nipple is used it should be turned wrong side out, washed with soap and hot water, and rinsed in cold water, then left in a jar containing boric acid solution.

After the baby has emptied the bottle, rinse it and let it lie in a pan of cold water.

Boil all nursing bottles before milk is put into them again.

AN ICE BOX FOR 10 CENTS

An ice box can be made of a wooden box filled with sawdust. Put the bottles in a large pail, fill the pail with ice and stand the pail in the sawdust. Keep the box covered.

A HOME-MADE NURSERY ICE CHEST

How to make an ice chest for less than fifty cents, in which the baby's milk can be kept cold at an expense of five cents daily for ice.

Take a quart milk bottle to the tinsmith and have him make a tin can about nine inches in diameter and of the same height as the milk bottle. An inner cylinder of tin, which should be just large enough to hold the quart milk bottle (or better, the eight nursing bottles filled ready for use), should be soldered into the center of the can. Also have the tinsmith make a cylinder of tin or galvanized iron ten inches in diameter and one inch higher than the tin can or milk bottles.

Then get an ordinary wooden box about four inches deeper than the can is high, and large enough to allow four inches of clear space on all sides when the can is placed in the box. Fasten the parts forming the lid together, and nail two strips of leather on the top at the edge of one side, to form hinges. Then nail about fifty layers of newspaper on the inside of the lid, and the box is finished.

Now place sawdust in the large box and pack it around the outside of the cylinder until the box is filled. Fill the space between the inner cylinder and the tin can with cracked ice, and put the can in the larger cylinder.

Each morning remove the can and pour the water out. Break up more ice and put in the ice space. This refrigerator, if properly cared for, will keep the day's supply of milk cool and sweet.

Do not give the baby cold or unmodified milk, but follow the directions of the doctor—and not the neighbors.

A HOME-MADE REFRIGERATOR

If there is no refrigerator in the home, and ice cannot be afforded, milk can be kept cool for twenty-four hours in a home-constructed "cooler" which will cost only twenty-five or thirty cents and will last the entire season. To make such a cooler, buy a butter tub with lid at the grocer's. It should cost ten cents. Purchase ten cents worth of sawdust (or your butcher or grocer may be willing to give you the small amount required). Make a bag of clean material, of a size that will fit the top of the tub closely, and fill this with sufficient sawdust to make a cushion about an inch thick. Sew up the open end of the bag, so that no sawdust can leak out. Fill the tub with sawdust to within an inch of the top. As soon as the milk arrives in the morning, sink the bottle into the center of the sawdust, leaving some sawdust underneath, and the rim of the bottle above, so that it may be pulled forth easily. Place the sawdust cushion on top and shut the lid on tightly.

Sawdust is a non-conductor of heat and will not allow the cold of the bottle to escape or the heat of the atmosphere to penetrate to it. However, whenever the milk is used, the bottle should be drawn forth, the amount desired poured out, and the bottle returned at once to the sawdust. Sawdust will not cool milk which has been allowed to get warm in the air.

When one or two cents worth of ice can be afforded, a good little refrigerator can be constructed with the butter tub and a lard can. Place a thick layer of the sawdust on the bottom of the tub, then put in the lard can and pack sawdust all around it, as high up as the can lid. A little piece of ice, wrapped in newspaper and placed in the bottom of the can, will keep all day, if the can is covered with the sawdust cushion and the lid of the tub is kept tight. Meat, butter, and milk can be placed in the can with the ice and kept good and cold.

DIRECTIONS FOR HOME PASTEURIZATION OF MILK

Use a metal pail or tin can which is several inches taller than the milk bottles. Fill the pail almost full of water and place it on the fire. When the water boils, set the pail off the stove. Now completely immerse the full-capped bottle in the water so that the cap is one-half to 1 inch under the surface. The immersing must be done quickly, otherwise the bottle is apt to break. Leave for twenty or thirty minutes. Then remove the bottle and set it aside until it has cooled somewhat; after which it should be placed in a pail of running water under the cold water faucet. The bottle should not be transferred directly from the hot water to the cold water, as this often causes it to break. When the milk has cooled thoroughly, place it in the ice box until it is used.

All the disease germs which may have been present in the milk will be destroyed in the above-described process.

WEANING

If the baby does well upon his mother's milk, he should be weaned when he is nearly a year old. If this time falls in summer, weaning should be put off till fall, if the baby's color and weight show that he is still thriving.

When time to wean, consult a doctor, for serious results may follow the feeding of too strong a bottle mixture. Patent foods are expensive, often harmful, and do not supply so nourishing a food as a mixture made from fresh, clean cow's milk.

If you have to wean the baby early, do not take this step before consulting a doctor. The milk mixture proper for feeding at this time needs to be fitted to the baby's digestion just as his shoes or clothing to his body.

Consult your doctor if the breast milk begins to fail, or the baby stops gaining weight, or seems ill in any way, but do not wean until you have had his advice. The return of monthly sickness does not demand weaning.

Learn the appearance of healthy bowel movements so that you can tell when the baby's digestion is out of order.

DIARRHEAL DISEASES

DOCTOR JOSEPH BRENNEMANN

Out of every 100 babies born in the civilized world, twenty-five die in the first year. Tuberculosis kills one-seventh of the civilized human race; being born and trying to live one year claims twice as many in a single year!

The vast majority of these deaths are due to improper food and improper feeding, and so are *preventable.* The new-born babe is so undeveloped that it needs its mother to complete it. Before birth it needed her blood, *after birth it needs her milk.* It is poorly prepared for any other food during the first few months. Cow's milk, while it is the best substitute for human milk, is nevertheless properly adapted only to the calf, and is about as well fitted for the baby as are grass, hay and raw oats for the adult.

The serious diarrheal diseases, summer complaint, cholera infantum, dysentery, food intoxication, are very rare in breast-fed babies. Ten times as many babies die that are bottle-fed as those that are breast-fed.

It takes the stomach two hours to empty itself after a breast feeding and three hours after a cow's milk feeding, and yet most babies are still fed every two hours, or every time they cry! Feeding too much and too often is the great cause of diarrheas in infancy, and probably kills more babies than any other cause. Add to this poor food, lack of fresh air and sunshine, keeping the babies dressed too warmly, and we have the reason why poverty and food disorders are inseparable, why one-half the children of the slums die, and almost none on the boulevards.

The heat of the summer months adds greatly to the deaths from diarrheal diseases. The baby can stand less food and needs less because of the heat, and yet gets just as much or even more, because its thirst is interpreted as hunger. It is both prostrated and overfed.

An ounce of prevention is worth a pound of cure. Keep your baby well. Nurse if you can possibly do so. Even a few weeks of breast feeding will start the baby right. The only complete substitute for a mother's milk is that of a wet nurse; the next best thing is clean, fresh, properly modified cow's milk.

Never feed the baby oftener than every three hours; four hours is better still. If the baby "won't go three or four hours," it's your fault, not his. In hot weather give him less food and more water. Keep him cool; "one garment or less" is a good rule in hot weather. Bathe him often. Treat him as you would like to be treated yourself.

If the baby is sick, has a diarrhea and no fever, etc., then simply give him less food and more water and avoid serious trouble. The time to cure a baby of summer complaint is before he really has it.

Don't worry about the second summer—it's the *first* summer that kills babies.

TEETHING

DOCTOR FREDERICK W. BELKNAP

Baby has a tooth!

The lucky person to discover it is supposed to receive a gold thimble as a reward. Babies have been born with teeth; some do not get a tooth until twelve months old. If baby does not have two teeth at the age of eight months, look for some error in food. The average healthy baby has two teeth at the age of six months. Many a poor baby has suffered for days from an abscess in the ear when the pain and restlessness have been ascribed to the teeth. Other ills too numerous to mention have been overlooked because baby was cutting a tooth.

Babies cut teeth from the age of six months to three years; therefore, if all the ills which are commonly supposed to be due to teething were really a fact and did exist, all the babies would be sick all the time between these years.

Of all questions in medicine, probably none has led to more discussion than this: Does the cutting of teeth affect the health of the child? You may settle this question to your own satisfaction and have a number of writers with unquestioned reputation to back your opinion whichever side you take.

It is my opinion that in a very large percentage of healthy children the cutting of teeth produces no symptoms. In the highly nervous or poorly fed and ill-nourished, a chain of symptoms may be produced which will last a few days (restlessness in daytime, loss of sleep at night, some temperature and loss of appetite and some bowel disturbance) which may be traced to the eruption of the teeth.

Consult your family physician when in doubt, especially if there be any rise of temperature, and give baby the benefit of the doubt, as you may prevent the serious illness or even the loss of the child.

It is unfortunate that the babies are not born with teeth, as many of the ills from over or improper feeding have been overlooked and allowed to run on into a serious condition because baby is cutting a tooth.

Don't think because baby shrieks with pain that there cannot possibly be anything else wrong with it because it is cutting a tooth.

Don't think because he is big and fat at one year and has no teeth that they will come in fine and that his nutrition is all right.

Don't think because he has a convulsion and a tooth is coming that he might not be developing a serious illness.

Don't think because the gums are swollen and red they need to be lanced. They seldom do and there is danger of infection in lancing, whereas a little rubbing or pressure with sterile gauze will accomplish the same results.

Don't neglect the care of the teeth after they do come.

CARE OF THE TEETH

FLORA ROSE

From the time they arrive until the time they depart, a trouble, and when they are gone most trouble of all, the teeth. The teeth begin to appear about the sixth month, although there is considerable variation in this, as well as in the order in which they come. The following table shows the usual order and time of eruption of the temporary milk teeth:

Lower central incisors	6th to 9th month
Upper incisors	8th to 10th month
Lower lateral incisors and first molars	15th to 21st month
Canines	16th to 20th month
Second molars	20th to 30th month

Early appearance of teeth is not uncommon and may not be indicative of any wrong condition. If the teeth are delayed the cause should at once be investigated, as this condition may indicate some serious defect in nutrition, resulting in retarded or interrupted bone formation. Teething is a normal process and should proceed fairly easily. Pain or sickness at this time should not be overlooked or set aside as being the natural result of teething. The cause may be indigestion or some deep-seated malnutrition, and it should be investigated.

The teeth should receive care from the first. Before the child is old enough to handle a toothbrush, the mouth should be washed out twice a day with absorbent cotton wet with dilute boric acid water. The importance of keeping the teeth clean is twofold: first, to prevent their decay, and second, to remove particles of food which, left in the mouth, decompose and later, when swallowed with the food, start decomposition in the intestine. Good digestion in later life depends so much on proper mastication that defective teeth often interfere seriously with nutrition.

It is poor economy to neglect the care of a child's teeth. Last year's hat and coat had better do double duty if it is a choice between new clothes and the services of a good dentist. In many of the large cities, dental inspection in the schools is being required, for it is now known that decayed teeth may so affect the child's general health as to make him dull and backward. It has been found to be cheaper for state and taxpayer to pay for medical inspection than to pay for teachers to go on teaching over and over again curably dull and backward children.

The child's dietary should be so regulated as to insure right nourishment of all bony tissues. Any habits such as "thumb sucking" or the habitual use of that pernicious plaything, the "soother" or "comforter," should be discouraged. The pressure on the gums through constant sucking throws the whole arch of the mouth out of symmetry and later makes mastication difficult and thus impairs digestion. Adenoids are said to be caused by thumb sucking and the use of the comforter.

RESISTANCE AND INFECTIONS OF INFANCY

DOCTOR ISAAC ARTHUR ABT

In the helpless, new-born infant, resistance against disease is only slightly developed, and the same infection or disease which would be of small moment in a mature adult, may produce the most alarming symptoms, and even death, in an infant. For example, a grown person in the prime of life attacked by erysipelas, is rendered severely ill, but rarely dies, while an infant is not only rendered severely ill, but almost invariably dies.

Infants present a difference in the degree of resistance. Some are born strong and robust and resistant, while others show feeble strength, low vitality and impaired constitution. It must not be forgotten that while some children are born feeble and delicate, others acquire debility and lowered resistance. Such infants as are brought up under insanitary conditions, who are unwisely fed and poorly housed, who suffer for want of ventilation, acquire not only feeble constitutions, but actual disease conditions. They become ready victims to infectious and contagious diseases, disorders of the digestive and respiratory tracts, and swell the sick list and the death-rate.

In considering the diseases of young infants, it should be stated emphatically that no matter how well the food is selected, a child with an enfeebled constitution, be it hereditary or acquired, will not prosper favorably. In other words, not only the food, but all the details which enter into the life and the mode of the child's living, are important factors for consideration. Cleanliness of house or home, cleanliness of the child's person, destruction of flies and other vermin (which are carriers of disease) are important factors in the prevention.

Because infants offer a lowered resistance, they should be most zealously protected against the acute contagious and infective processes. To a child of 4 or 5, measles may be only a slight ailment; to a child of 1 year or less, this same disease is always a serious disorder, and not infrequently threatens its life. Tuberculosis is more likely to run a rapid and severely fatal course in infancy than in any other stage of life. For this reason young infants should be protected against contamination from infection; they should be kept away from those individuals who are known to suffer from tuberculosis. Every precaution should be taken to prevent the spread of acute infectious diseases among babies.

We are considering infant welfare and in the hour of concern about the preservation of child life, let us arouse within ourselves and others a sentiment for improvement in this direction. If this alone can be accomplished, this demonstration in the interest of child life will have been worth while.

As we stated at the outset, the resistance of the new-born baby is low; and it is well known to mothers, as well as physicians, that during the heated term of summer the infant is subjected to greater danger from disease and infection than at any other period of the year. The expression "summer complaint,'' which had its origin here in America, is fully warranted by the seasonal recurrence of the disease. The condition expends its fury in large cities, particularly in the crowded quarters. The spot maps of the Chicago Health Department show the excessive death rate in those divisions of the city where overcrowding is most marked and where sanitation and hygiene are least practiced.

Statistics show, too, that the height of the death rate is proportionate to the heat of the summer; thus during a cool summer the death-rate is relatively low and during a hot summer relatively high.

Investigation has shown that it is not the external heat which produces the baneful results as much as the heat within the homes, produced by overheated cooking stoves, small, stuffy rooms and poor ventilation, and that the mortality is highest among hand-fed babies. Whatever may be the immediate cause, a very important factor or, we may say, the predisposing cause, is the diminished resistance in the infant produced by the excessive heat. For this reason all that pertains to the hygiene and care of infants should receive the most careful consideration during this period of the year.

The food should be most carefully supervised. There is more danger of overdressing than underdressing babies at this period of the year. The children should be given frequent baths and an abundance of fluids, particularly water, and whenever possible they should be carried to the parks or the water front. The surest and safest prevention of summer complaint consists of breast feeding during the heated term.

Preventable diseases are the common enemies of mankind; because this is true it is everyone's duty to aid in the work of bringing them under control.

CONTAGIOUS DISEASES

DOCTOR FRANK X. WALLS

The story of the infectious diseases can be told in a simple statement: Virus plus susceptibility equals infectious disease. Susceptibility to the infectious diseases may be reduced somewhat by right living, but young tissue, even in perfect health, has a definite susceptibility to the infectious agents, and the only sure way to avoid infectious disease is to prevent the virus reaching the individual.

Quarantine and disinfection.
Proper hygiene and protection.

Foremost of the contagious diseases of the young is tuberculosis. At no period of life is susceptibility to tuberculosis so high as during infancy. The infant who lives in a tubercular house cannot escape infection.

Fourteen per cent of the infants who die under a year show at the autopsy tuberculosis. Not all that are infected die during the first year; in the majority the tuberculosis becomes latent and may later be revived by measles, whooping-cough or influenza. The tuberculosis child is not necessarily an emaciated nor anemic individual. Many a child is plump and of good complexion immediately before the onset of tubercular meningitis. Behring says consumption begins its life in the cradle of its candidate. Don't let the human consumptive live with the baby; don't feed the baby bovine bacilli.

Smallpox is no longer a common disease, because vaccination has reduced the susceptibility, and this fact must be remembered lest we grow careless and forget that 99 per cent of individuals are susceptible to smallpox, and if exposed will contract the disease.

Next to smallpox in point of susceptibility comes measles, to which 68 per cent of individuals are liable. The virus of measles is more volatile than that of the other infections and its epidemic more widespread. Thirty-eight per cent are susceptible to scarlet fever. A raw surface on skin or mucous membrane, neglected mouths, diseased tonsils or adenoids, may arrest the virus and infect the host.

The life of the virus is very tenacious, existing years. The virus clings to clothing, bedding or furniture, and it may be carried a long distance. It is contained not only in the desquamating skin, but in secretions from the mouth, nose or diseased ear, and probably in the urine and bowel movements.

Space limitation prevents more than mention of diphtheria, typhoid, influenza, dysentery, pertussis, cerebrospinal meningitis and acute rheumatism.

These diseases may be disseminated by (1) the sick individual; (2) by the individual, apparently well, who is a "carrier" and breeds the germs in nose, throat or other organ, or (3) the virus may be borne by wind or water, or conveyed by person or thing indirectly to the susceptible victim.

PHYSICAL EXAMINATIONS

So much attention is given in the public schools to the personal hygiene of children that it is remarkable how often the subject is overlooked in the home. Some fathers and mothers, perhaps, rely too much on these new agencies outside the family, whereas all parents ought to realize that they alone are responsible for the health of their boys and girls.

Doctors are attaching more and more importance to the child's gains in height and weight as indications of its nutrition, yet usually the only signs that the child's family gives of being aware of its growth are some marks on the dining-room door-post, made at irregular intervals! Records of the child's height and weight, taken regularly and accurately, would be of great importance, even to a layman, in judging the physical progress of his child, and as a guide in determining questions of play, employment or school.

Every mother should learn the characteristics of health in her baby, its color, symmetry, nutrition and action. Nothing, however, will take the place of a systematic and thorough medical examination at least annually, until growth is nearly complete. How often we hear the surgeon say of a deformity: "If I had only seen this earlier!" He is blaming the parents, who should have noted the defect and reported it years before. They may leave the matter of examination to the physician or to the physical director at school or college, but they cannot thereby relieve themselves of the responsibility for an intelligent knowledge of their child's physique.

As a guide in determining whether the child is normal or not, a table is here given, indicating the normal height and weight, *without clothes,* of boys and girls from five to sixteen years of age. In using it, it must be borne in mind that the size of the parents, precocity and many other elements make children vary considerably from these figures. Being made up from statistics of children in our public schools, they are average rather than ideal.

If clothes are included in the weight, make allowance for them in this way: For boys between the ages of five and sixteen years allow eight per cent of the gross weight; for girls, seven per cent. Subtract this clothes allowance from the gross weight and compare the result with the figures in the table. This allowance is for clothing of average weight; it includes shoes, but not outer wraps.

TABLE OF NORMAL WEIGHT AND HEIGHT

Age	Boys' Weight	Height	Age	Girls' Weight	Height
5	39.3 lbs.	41.6 in.	5	38.2 lbs.	41.5 in.
6	42.6 lbs.	43.5 in.	6	40.8 lbs.	43.2 in.
7	46.8 lbs.	45.5 in.	7	45.6 lbs.	45.7 in.
8	50.9 lbs.	47.7 in.	8	48.8 lbs.	47.3 in.
9	55.1 lbs.	49.5 in.	9	54.9 lbs.	49.7 in.
10	61.3 lbs.	51.5 in.	10	59.9 lbs.	51.7 in.
11	64.9 lbs.	53.1 in.	11	63.9 lbs.	53.2 in.
12	72.5 lbs.	55.2 in.	12	72.7 lbs.	55.9 in.
13	78.3 lbs.	57.1 in.	13	83.5 lbs.	58.5 in.
14	87.4 lbs.	59.4 in.	14	94.4 lbs.	60.3 in.
15	103.3 lbs.	62.2 in.	15	102.8 lbs.	61.7 in.
16	116.4 lbs.	64.4 in.	16	110.8 lbs.	62.2 in.

—*The Youth's Companion.*

DRUGS

FLORA ROSE

The belief that all ills may be cured with drugs is fortunately diminishing as the knowledge of nutrition and hygiene increases, but there is still too much "faith in the label on the bottle." Only a good physician should be allowed to determine what medicines shall be given to the child. The following quotations concerning soothing syrups are made from a recent government bulletin on habit-forming agents, and show what disastrous treatment is often innocently given to the baby:

"It has long been known to the medical profession that these products as a rule contain habit-forming agents, but the majority of mothers have been and still are ignorant of this fact.

"In some instances, in which the remedy is freely used and the child does not succumb, there is developed a case of infant drug addiction. As soon as the effects of one dose pass away, the child becomes irritable and fretful, with the result that another dose is administered, the craving is met, and the child is quieted, a condition which is analogous in every respect to drug addiction among adults. The chief active agents of soothing syrups are well known to be opium, morphine, heroin, codein, chloroform, and chloral hydrate in some combination.

"Soothing syrups containing habit-forming agents, used without discrimination, undoubtedly leave their impression on the delicate organisms of infants and induce tendencies which under unfortunate circumstances in future life may be aroused to activity and develop an evil habit of one form or another. The question arises: How is this condition to be met? The signs of the times point to two ways, namely, education, and the withdrawal of the dangerous articles, both measures appearing to be necessary. At present there are on the market, intended to be used for children, several mixtures free from the customary habit-forming agents, but they apparently do not give satisfaction as formerly, as manufacturers are constantly receiving calls for the 'old kinds'."

THE TRAINING OF PARENTS

FLORA ROSE

Physicians, lawyers, engineers, teachers, must all receive definite technical training before they are adjudged ready to assume their professional duties. A plea must be made for training parents. Is there any profession which, to be successful, requires greater intelligence, resourcefulness, endurance, self-control, ability to lead and to govern, than being just a parent? The knowledge of children and their needs is but little more inborn than a knowledge of law or medicine. In every home, an effort should be made to learn through books, or directly through the experience of others, something of the needs, both physical and spiritual, of the children in the family. The best inheritance a child can have is the training and care given to it by thoughtful, intelligent parents.

XII

HOW CHILDREN ARE MADE DRUNKARDS

WILLIAM LEE HOWARD, M. D.

THE other day I attended the funeral of a dear friend and patient. When twenty years of age he promised to be one of the literary lights of this country.

The pace he set for himself was not rapid for an individual physiologically balanced, yet he could not maintain it without artificial assistance. So he was compelled—mark you, I say compelled—to keep propped by stimulants. It is a long story to a short end. The sad termination came at thirty-eight.

His mother, sister and closest friends could not account for this fine boy's merging into the drunken man. I worked hard over that boy. But I had nothing to build upon. His nervous structure was sand—quicksand.

"But," said his mother to me, "how could Robert become such a slave to drink? What was the cause?"

Of course, there was a cause; there must be a cause for every effect. I did not know it, but I determined to find it.

The essential thing to know when treating instability is the family history of the patient. In this case the family history was excellent. He came of sturdy Scotch stock. No nervous affliction on either side as far back as could be traced. Grandparents, father and mother were all temperate people. The sister, three years older than the brother, was a normal woman, the mother of three healthy boys, athletes and strictly temperate in all things.

Yet here we had an extraordinarily brilliant young man whose career was ruined because he had to have stimulants. He abhorred the stuff, made mighty efforts to get along without it, but it was a physiological impossibility.

After long and minute investigations I discovered the truth—the awful, warning truth, which, when it reached the heart of his mother, brought her to the grave. She had allowed his delicate, baby nerve-cells to be poisoned, distorted, by opium and alcohol—innocently, ignorantly, of course.

This mother of Robert was very ill immediately after his birth. He was given to a supposedly responsible nurse. The best-intentioned nurse cannot feel the future responsibility to the child. If the child disturbs her rest and annoys her by its cries, what is more natural than that she should give the baby a dose of one of the much-advertised "harmless soothing syrups"? Of course, baby sleeps quietly; he is in an opium sleep. Of course, he looks fat and well nourished; he is drug-bloated.

In this case I found that a little gin was frequently put into the baby's milk. "It is good for the kidneys," the old nurse said. Then she said that it was the custom to give a little "soothing syrup" to all babies. "It helps to soften up the gums." It did. And it also helped to soften up the delicate tissues of the brain.

When the mother recovered, the babe was given to her. But he missed his opium; he yelled and went into spasms; every tiny nerve-cell was crying out for its poison. But there was a "cure" for his agony.

A "soothing syrup" was given to him, and he "sweetly" slept, only to be poisoned again when the effect had worn off and he cried for more.

So we buried this young man—a man poisoned by drugs when a babe and ostracized as a drunkard when a man because his nerve-cells never grew to manhood's necessities.

How many mothers, and good mothers, too, are innocently and ignorantly allowing their sons and daughters to start on a drunkard's career, commencing at the cradle in the same way! These mothers forget one thing: that every healthy baby should cry and kick. That is its way of filling the lungs and developing the muscles. To "soothe" it with anything but pure food, fresh air and loving arms is to send it out into the world an undeveloped, helpless being.

To give a baby any of the so-called "soothing syrups" is worse than murder—a living death. For, mark you this well: the principal ingredient in the average "soothing syrup" is some form, some derivative, of opium, laudanum or morphine. There may be one or two exceptions, but don't even allow these in the house. If it is called "tincture" remember that the average tincture contains alcohol.

No drug known is so poisonous, none so quickly works irreparable damage to the infant, as opium and its derivatives. It devours the nerve-cell substance; it weakens the tissues of the brain; it eats out a man's capacity to think or act except when he is under its influence; it is the drug that throws on to the world the poor, helpless beings who fill our reform schools, insane asylums and drunkards' graves.

The sad part of this drugging of infants is that it occurs for the greatest part among those who need all the advantages of pure food, fresh air and hygienic attention. The ignorant mothers believe the delusive advertisements, have implicit faith in the unscrupulous druggist, and the baby is opiumed from the day of its birth.

It is useless to look for moral and mental defects in the public school children when the real cause, drugging in the cradle, is overlooked.

Nor is this cruel murder of children confined to one class. Who is most to blame—the woman of wealth who simply gives her child over to a hired nurse and does not take the trouble to give her baby the soothing caresses that soon lull it to sleep, or the worn-out mother of the tenement, who, seeing her fretting child, ignorantly gives it opium—or, in other words, a "soothing syrup"?

I know a man whose mother believed in "soothing syrups." She would not believe that they were "doped." So, whenever the child cried, it was given a spoonful of the "syrup." Of course, it made him sleep. When his "soothing-syrup" days had passed by, she discovered that he was nervous and fretful. He was given a "tonic" to "tone him up"—the tonic contained opium again, and alcohol. Of course, it "toned him up." But soon the system refused to respond to the "tonic." It was not strong enough and yet the moment he stopped the "tonic" he became listless and incapable of work. Finally, he had to resort to the next more powerful drug—morphine. He became a morphine fiend. He had reached a desirable professorship—one of the most successful professors in the college. But soon it was noticed that the brilliancy of his eye was unnatural, and, to make a long story short, the truth came out. He lost his professorship, he got morose, his mother died from a broken heart, and the man is today in an insane asylum. There you have a direct line from the "soothing syrups" of the cradle to the "morphine" of the man, and to the asylum.

I have said that babies get alcohol through nurses' milk. I have directly traced cases of habitual drunkenness to this cause.

Quite frequently you will find a nurse who is feeding a child, who takes a glass of beer or ale with her meals and at night. She tells you that her doctor told her she needed some such tonic to keep up her strength. Now, it is not probable that a glass of beer at meal times will have any appreciable effect on the milk. Nevertheless, it is tampering with a dangerous possibility.

The human system can, physiologically, burn up a certain amount of alcohol during twenty-four hours. But just what that quantity is for different individuals is uncertain. One nurse may be able to consume several bottles of beer during the twenty-four hours and use up in her system every drop of the alcohol so that none is left in the secretions. But—and here is the important point—she may at any time exceed this amount. She may take in more alcohol than the tissues can burn and the residue will be found in the secretions. In the nursing woman, the milk secretions are the most active; hence, here the excess alcohol will be found, and your little baby gets its first poisonous drink. And if your baby is getting any of the by-products of beer or whiskey it will soon become fretful and irritable. It is then only a short step to the bottle of "soothing syrup."

Thousands of babies are started on drunkards' careers in this way. And there is but one way to avoid it. Never "soothe" a child except by Nature's own ways. The moment a "syrup," a "liniment," a "cure" of any sort is advertised as putting a baby to sleep, or soothing it, look out for it. That is the article, of all others, you do not want in your home to give your child. From such concoctions, with their morphine, opium or laudanum, do we make drunkards of our children!—[*From The Ladies' Home Journal, by permission.*]

XIII

HOW TO JUDGE THE BABY

EMELYN LINCOLN COOLIDGE
Of the Babies' Hospital, N. Y.

IT is very difficult for a young mother who has never before had a child to care for to judge whether her baby is up to the average in its weight and general development; she has no experience of her own to fall back upon, and each friend tells her something different, until she is utterly at sea to know whom to believe. The averages which I give here have been taken from a large number of children, but, of course, all babies differ somewhat and the mother must not worry if her own baby does not quite come up to these standards.

	Weight Pounds	Height Inches	Chest Inches	Head Inches
At birth	7½	20½	13½	14
One year	20½	29	18	18
Two years	26½	32½	19	19
Three years	31	35	20	19¼
Four years	35	38	20¾	19¾
Five years	41	41½	21½	20½
Six years	45	44	23	..
Seven years	49½	46	23½	..
Eight years	54½	48	24½	..
Nine years	60	50	25	..
Ten years	66½	52	26	..

Weight and general measurements

First let us take the development in weight and general measurements; the table which is given is taken from Doctor Holt's little book, "The Care and Feeding of Children." The weights given for the first four years are to be taken without clothes, after that with usual house clothes. Both measurements and weights are for boys; girls usually weigh about one pound less, but measure nearly the same as boys.

Many mothers enjoy keeping a little record of their babies' weight and measurements. At first, of course, the child must be measured when lying out perfectly flat on a table, but when he is able to stand still and steadily on his feet, it is a good plan to take his height standing upright. He may stand with his back against a tall, flat piece of wood, a piece of cardboard placed on the top of his head, perfectly level, and then a mark made on the wood where this cardboard touches it; the length from the mark to the end of the wood next to the floor may then be measured with a tape measure and the child's height noted. It is interesting to keep this piece of wood from year to year, placing the date above the pencil marks; one can then tell at a glance how much the child has grown in one year.

The fontanel

Another important point in the development of a child is the closure of the little soft spot on top of his head—the "fontanel." This usually closes about the eighteenth month, but if a few months earlier or later it is all right. Should it still be open when the child is two years old, however, there is something wrong; in many cases the child has a tendency to rickets, the bones are soft and the body not nourished as it should be.

The neck and back

Every mother knows how very weak a baby's neck is at first, and great care must be given to support the little head; but by the time the baby is four months old the head should be held erect if the body is supported, and generally by his sixth or seventh month he should sit alone holding the back straight and head upright himself. At this time the baby will also often creep or hitch himself along on the floor. When he is nine months old comes the first real attempt to stand on the feet, and at eleven or twelve months many children can stand alone.

Walking

When the baby is one year old he begins to walk by taking hold of chairs, the mother's hand, etc., and by the time he is fifteen or sixteen months old can usually run about by himself very well. Never, under any circumstances, should the baby be forced or urged to do any of the things above. Bow-legs and other troubles may be caused by urging the child to advance faster than he is really able. If, by the time he is eighteen or twenty months old, the baby makes no attempt to walk, then there is reason to worry, and a reliable doctor should be consulted. Here again rickets is a frequent cause; babies who have been fed on some of the proprietary foods, condensed milk, or even those who have been nursed too long, and nursed exclusively, are most often the victims of this disease.

Order and time of teething

The development of the teeth is another thing in a child which often worries the mother. In the first set—or milk teeth—there are twenty. At any time from the fifth to the ninth month the two lower teeth, or central incisors, may be expected to appear. Then from the eighth to the twelfth month the four upper middle teeth, or upper incisors, usually come. From the twelfth to the eighteenth month the other two lower teeth and the four front double teeth, or molars, appear. Between the eighteenth and twenty-fourth months the canine teeth, four in number, are cut. The two upper canine teeth are often called the "eye teeth," while the two lower ones are known as the "stomach teeth." Last to be cut in this set are the four back double teeth, and they may be expected between the twenty-fourth and thirtieth months. The mother will see by this that the average healthy child has at one year six teeth, at eighteen months twelve teeth, at twenty-four months sixteen teeth, at thirty months twenty teeth.

In the second set of teeth are thirty-two; they generally begin to come when the child is six years old, hence those first cut in this set are commonly known as the "six-year-old molars." The second incisors generally come from the seventh to the eighth year, the bicuspids between the ninth and tenth year, canines from the twelfth to the fifteenth, third molars, or "wisdom teeth," at from seventeen to twenty-five.

Backwardness in cutting the teeth may be laid to improper food, premature birth, rickets, or any serious illness that may have retarded the child's growth. If, at one year of age, a child has no teeth, there should be some radical change made in his diet. Beef juice, orange juice, or sometimes a little lime-water added to the milk, with soft-boiled eggs, gruels and broths, will be much better to give such children than medicine.

Average mental development by months

The mental development of a child, of course, varies greatly with the individual child, but here are some averages which may be of interest to the young mother: During the first month the baby is fully able to realize that by screaming he can generally get some attention—some one will pat him, rock him or walk with him; so do not think he is too young to be trained, for this is not the case. The second month he will show pleasure by smiling and turn his head in the direction of a sound. When three months old he will often recognize his mother or nurse, will "coo" and even reach out his hand for a bright object, and he begins to cry with real tears. The fourth month brings, generally, considerable advancement in the mental development of a baby; he uses his hands with some set purpose, making use of his thumb in grasping objects; he begins to put toys, etc., into his mouth and will often throw objects on the floor with the evident expectation of having them picked up for him. He will often, at this time, begin to show signs of fear. A baby five or six months old will frequently show that he knows the names of people by looking at any person called. By this time he will laugh out loud. At any time between the sixth and eighth month a child can be taught to play "pat-a-cake" and shake a "by-by," and at the ninth month he will often be able to say "papa," "mama," and sometimes make a little noise that he evidently intends for singing. When the baby is a year old he seems to understand a great deal of what is said to him and can say several words of one syllable himself. When he is two years old he ought to begin to form short sentences, putting words together with a definite meaning. If a two-year-old child cannot say anything at all, and he has had no serious illness to account for his backwardness, there is some cause to fear that the baby is deaf and dumb or else that there is something wrong with his brain. Children who play alone or are with adults only the greater part of the time, are much more apt to be backward in talking than are those who have little brothers and sisters to play with and teach them by example to talk.

Hope for backward children

While it is, no doubt, a great trial for a mother to have a backward child, she should try not to be too sensitive about it, but as soon as she realizes her child is not like others, she should take him to the best authority as soon as possible. Sometimes a great deal may be done with children while they are quite young, while, if the mother waits until the child is half-grown before seeking aid, the chances of improving him are much lessened. This applies to both mental and physical backwardness.—[*From "The Ladies' Home Journal," by permission.*]

[The editor wishes to emphasize the necessity of determining early, the fact of arrested development. Family pride, refusing to recognize the early stages of backwardness, may suffer more when help comes too late. A little timely advice from experts may save the child's future.]

XIV

BABIES' BUDGETS

A Summary of Actual Records Gathered from the Experience of Many Parents

MARY A. HOPKINS

THE lowest possible cost of feeding and clothing the baby was illustrated in the recent Child Welfare Exhibit, New York City. Fifteen cents a day for food and $7.00 a year for clothes was considered the baby's share of an $800.00 income in a typical family of five members. On one table was exhibited a baby's model breakfast, dinner, and supper of cereal, bread, butter, egg, soup, meat, vegetable and fruit, the cost of the three meals being fifteen cents. On another table was an exhibit of the best number and quality of clothes to be bought for $7.00. Food and clothing together came to $61.75 a year.

There was always a group of troubled mothers standing before these tables, protesting: "My baby eats more than that!" "Two winter shirts aren't enough!" "Shoes cost more!"

I asked some of these mothers, who said that their real babies cost more than this hypothetical baby, to calculate just how much they spent, and I sent the same request to other mothers in widely separated parts of the country. The accounts reproduced in this article are from people of moderate income, neither rich nor poor. They have all they need for their babies, but not all they want.

The figures make no pretense of being exhaustive or scientifically accurate; their interest lies in the fact that they are the actual amounts that mothers are spending on their babies today. The average expense of the twenty-five babies is $177.07 a year. This gives a basis of comparison by which parents can measure their expenditures. How does it agree with your account book? What sum do you invest in your baby to obtain that store of blood and bone and health which the truly thrifty parents want the baby to lay up for future use?

NURSE VS. MOTHER

The four largest items in a baby's budget are usually food, clothes, doctor's bill, and wages and maintenance of nurse. Where a nurse is hired I have kept that expense separate from the total, for this reason: A child is cared for either by a paid nurse or an unpaid mother. The value of the nurse's work is standardized, the value of the mother's work is not standardized. We say, prettily, that the mother's care is beyond all price, but at the same moment we assume that it has no market value at all. It is confusing and untrue to count the cost of this labor in the one case as an expense and in the other as a saving. This lack of a unit of comparison with which to measure the relative cost of mother labor and nurse is clearly shown in the three first budgets.

These children all live in New York City. It is not safe for them to be out of doors alone. Some grown person must spend four hours with them in the park each day, if they are to have the proper amount of fresh air.

BUDGET 1—Age, 1½ years

New York City

1 quart milk	$ .10
Eggs	.11
Meat	.07
Fruit	.06
Vegetables, cereals, crackers, zwieback	.06
Gas	.10
Per day	.50
Per year	$182.50
Clothes (half home-made)	$ 60.00
Doctor and nursery supplies	60.00
Toys	12.00
Total	$413.50

(Wages of nurse, $18.00 to $20.00 a month; maintenance $12.00 a month; $360.00 a year.)

Mother number one has a nurse; mothers two and three take care of the children themselves. Mother number one says, frankly, that she hates sterilizing milk and that the nurse can push a go-cart as well as she can. So for eight hours a day she leaves the baby in charge of a nurse, under the grandmother's supervision, while she herself works in an office. The wages and maintenance of the nurse cost her $360.00 a year; she earns $1,000.00, thus adding $640.00 a year to the family income.

BUDGET 2—Age, 1½ years

New York City

1 quart milk	$ .20
Meat	.20
Orange	.03
Olive oil	.01
Eggs	.05

Vegetables, etc.	$ .05
Gas	.05
Per day	.59
Per year	$215.35
Clothes (ready-made)	$ 50.00
Total	$265.35

Mother number two does not go out to earn money, but stays at home to save money by sterilizing milk and pushing the go-cart herself. She is a brilliant woman, educated abroad, fully the equal of the first woman, but with all her brilliancy and all her education, the limit of her savings—the amount she adds to the family income—is $400.00 a year.

From a purely economic point of view, it is obvious that a mother, whose earning capacity is higher than a nurse's, can earn more than she can save. Most mothers, however, consider it more desirable to be with their children constantly themselves than to add to the family income.

BUDGET 3—Ages 3½ and 5½ years

New York City

2 quarts milk	$ .18
Meat	.14
Cereal	.06 1/2
Eggs	.06
Fruit	.05
Vegetables	.05
Pudding	.09
Educators	.02 1/2
Toast, butter	.02
Gas	.07
Per day	.75

Per year	$273.75
Clothes for girl (part home-made)	$135.00
Clothes for boy (part home-made)	80.00
Total (two children)	$488.75

This is the way mother number three views it. Before her marriage she earned about $100.00 a month. She gave up this income in order to supervise her children herself. When I remarked that her children had a high-priced nurse, she replied contentedly: "They give the best returns of any work I ever did."

The easiest item to figure is the daily cost of food. Each mother could calculate that immediately. It varies widely, not according to the age of the child or the locality where he lives, as much as according to the child's health and the extent the mother can cater to his needs. The lowest estimate is that of the three-year-old St Paul boy (Budget 7), who eats only 15¾ cents' worth of food a day; the 15 cent estimate for the hypothetical Child Welfare baby, plus ¾ of a cent for cooking gas. The highest is 59 cents a day for a frail little New York girl (Budget 2), who is fed meat juice instead of broth, olive oil, and 20 cents a quart milk. The special diets, which we are coming more and more to give children instead of medicine, raise the expense sometimes as much as a hundred dollars a year. For instance, the two little boys of Budget 12 have a tendency to rheumatism, so they are given chicken or squab or some other high-priced white meat which works against uric acid. The daily food expense of the healthy children varies around 35 cents. It is divided into three parts: cost of food for the first six months, for the second six months, and for the second year. It was originally calculated by the month, but is here reduced to days:

BUDGET 4—Age, 1 year
Chicago

1 quart milk	$ .15
Limewater	.00 5/6
Milk sugar	.00 3/6
Per day	.16 1/3
Per six months	$ 29.81
2 quarts milk	$ .30
Limewater	.00 1/3
Beef juice	.01 1/3
Potatoes	.00 1/6
Apples	.00 1/3
Egg	.01
Orange or prune juice	.00 1/3
Cereal	.00 1/3
Bacon	.00 3/6
Per day	.34 1/3
Per six months	$ 62.66
Per year	$ 92.47
Clothes (home-made)	$ 18.50
Total	$110.97

At 2 years of age

Food (same as second six months)

Per year, 34 1/3 per day	$125.32
Clothes (home-made)	44.90
Total	$170.22

BUDGET 5—Age, 3 years
Spirit Lake, Ida.

1 quart milk	$ .10
Meat for broth	.10

Eggs	$ .03
Fruit	.05
Oatmeal	.02
Toast	.01
Fuel	.05
Per day	.36
Per year	$131.40
Clothes (home-made) from $50.00 to $75.00	$ 62.50
Total	$193.90

(Nurse, wages, $4 to $5 per week; maintenance $3 a week; total, $390 a year.)

BUDGET 6—Age, 4 years

Pasadena, Cal.

Milk	$ .03
Eggs	.02
Meat	.04
Fruit	.09
Cereal, vegetables	.06
Bread	.03
Gas	.08
Per day	.35
Per year	$127.75
Clothes (home-made)	$ 30.00
Doctor, drugs	$ 5.00
Toys	8.00
Total	$170.75

BUDGET 7—Age, 3 years

St. Paul

1 quart milk	$ .08
Meat, eggs	.03
Bread	.01
Vegetables, fruit	.03

Gas	$ .00 3/4
Per day	.15 3/4
Per year	$ 57.49
Clothes (home-made)	$ 27.84
Doctor	4.00
Laundry	39.00
Total	$128.33

BUDGET 8—Age, 2 years

New Bedford, Mass.

1 quart milk	$ .08
Meat	.10
Eggs	.03
Fruit	.03
Cereal	.02
Toast	.03
Per day.	.29
Per year	$105.85
Clothes (home-made)	$ 25.00
Doctor	15.00
Laundry	26.00
Total	$171.85

The cost of clothing is difficult to calculate. We must not over emphasize the apparent saving on home-made garments, for the woman who does her own sewing may have to hire assistance in her housework, while another may spend more money at the outset on ready-made clothes, but do without domestic help. Budgets 9, 10 and 11 are families where the old-fashioned, hand-down system still prevails. Mother number nine makes lovely linen suits, which are worn first by the big boy and then by his brothers.

The littlest brother is energetically wearing out leftovers in the way of baby clothes. Baby 11 is really too young to come into this article, but the budget is so optimistic that I have inserted it.

BUDGET 9—Ages, 6 years, 4 years, and three months
Bangor, Me.

2 quarts milk	$ .14
Meat	.25
Cereal	.10
Eggs (cooking only)	.05
Fruit	.05
Toast, etc.	.05
Gas	.10
Per day for two oldest	.74
Per year	$270.10
Clothes (most home-made)	$ 50.00
Doctor's bill	100.00
Extra (hair cuts)	6.00
Total (three children)	$426.00

(Nurse—wages, $130.00; maintenance, $120.00; Total, $250.00 a year.)

BUDGET 10—Ages, 1, 3, and 4½ years
Bangor, Me.

Milk	$ .07
Mellin's Food	.04 2/7
Broth, meat juice	.04 2/7
Fruit	.01 3/7
Cereal	.00 2/7
Per day (for youngest)	.17 2/7
Per year	$ 63.09
Food for two older about $4.00 a week each	$416.00
Nursery supplies	12.00

Clothes—"There are a great many clothes I have used for all the children which are still good. But each child needs some new."

Amount spent on new probably.	$100.00
Total (three children)...........	$591.00

(Nurse maid—wages, $4.00 a week; clothes $25.00 a year; total, $441.00 a year.)

BUDGET 11—Age, 9 months
New Bedford, Mass.

"My baby is a wonder. He is no expense whatever for food, being breast fed; nor for clothes, wearing his sister's leftovers; nor doctor nor nurse, having had none since he was three weeks old; nor even for laundry, as he wears seersucker rompers almost entirely, and I do all his washing myself. He is very stirring, and I can imagine that shoes will soon be a big item."

Nearly every mother spoke of the expense of shoes. "They wear out their shoes so fast!" said mother number eleven in despair. "A new pair every two months! What they don't wear out they outgrow. The little fellow's feet are a different shape from the older one's, and he can't wear the other's old shoes. What shall I do? There is a whole shelf full of perfectly good ones!"

Mother number twelve spends $30.00 a year for shoes for her two boys, paying from $1.50 to $3.50 a pair, according to size and quality. Mother number three reckons on five pairs apiece for her two children at $2.50, a total of $25.00 a year. Mother number nine, who was able to bring the clothes expenditure within twenty-five dollars because there were many clothes left from an older sister, spent $7.50 for shoes; five pairs at $1.50. Mother number ten reckons $9.00 for her two boys' shoes. These expenditures are approximately 14 per cent, 12 per cent, 30 per cent and 18 per cent, of the entire clothes expense.

There are, also, irregular expenses which cannot be foreseen as clearly as shoes. For instance—the doctor's bill. Many of these thirteen families have no doctor's bill at all and others have small ones—$5.00, $4.00, $15.00, $20.00. There are two large bills, $60.00 and $100.00. The younger boy of Budget 3 has never been sick a day in his three years and a half.

A baby costing $298.19 and a baby costing $91.56.

BUDGET 12—Ages 3 and 2 years

New York City

1 quart milk	$ .15
Meat	.22
Cereal	.10
Cream	.07
Eggs	.10
Pudding or fruit	.10
Bread and suet butter	.10
Vegetables	.05
Soup	.02 1/2
Gas	.07
Per day	.98 1/2
Per year	$359.53
Clothes	$216.85
Doctor's bill	20.00
Total (two children)	$596.38

(Nurse, $25.00 a month: maintenance $20.00; total $540.00 a year.)

BUDGET 13—Age, 2 years
New York City

1 quart milk	$ .10
Sugar, lime, etc.	.03 4/7
Eggs, soup, etc.	.03 4/7
Cereal, zwieback, etc.	.03 4/7
Per day	.20 5/7
Per year	$ 75.61
Clothes	$ 15.95
Total	$ 91.56

There are five children in this family, from two to eight years old. The food of the oldest boy comes to 24 cents a day, $87.60 a year, and his clothes to $23.25, a total of $110.85 a year.

The other three children vary between these two extremes. The children cost an average, the mother says, of $100.00 apiece.

In the first of these two families $600.00 pays for two children; in the second $500.00 pays for five. Mother number twelve threw up her hands when I told her about mother number thirteen, and cried: "You will have to put me in as a horrible example! I'm a bad manager, but I want them to have the best, and the best costs so much!" In both families the children are well fed and well clothed. The difference in the cost of their food and clothes comes in this way: The two children of Budget 12 have a special diet because of a tendency to rheumatism; this more than doubles the cost of their food. They wear simple clothes, but of the exquisite simplicity procured at high-priced stores which make a specialty of excellent goods and cut. This loveliness in appearance is costly. Each child has eight changes of garments. The mother buys both food and clothes lavishly, but not ignorantly. She knows the cost of every article and she gets the worth of her money.

Mother number thirteen, on the other hand, must count pennies. She feeds her children on the plainest nourishing food and dresses them with the utmost economy. The reason she succeeds in dressing and feeding five children on an average of $100.00 a year each is that she is a rare combination of brains and health and pluck.

If there is a money unit to measure a mother's efficiency, we should say: "It takes a thousand-dollar a year mother to bring up a hundred-dollar a year child."

Here are the varying costs of twenty-five children:

$314.50
265.35
488.75 (two children)
110.97
170.22
193.90
175.70
$128.33
171.85
128.33
170.40
426.10 (three children)
591.09 (three children)
596.38 (two children)
500.00 (five children)

The average expense is $177.07 apiece, exclusive of indirect expenses, like higher rent, additional service, summer outings, etc.

I sent the last budget blank to a man living in a large city, asking him to get data from one of his married friends. He replied: "I am sorry that I haven't been able to fill out the baby budget. We young professional men don't often get married, and when we do we are not strong on babies—and why? Because we don't get enough salary to pay for the luxury of wife, baby and home. I get awfully discouraged over it sometimes.'' There are thousands of thoughtful young men and women today who class babies among the luxuries they can't afford.

The economists look backward to tell us what was, and forward to tell us what will be. They have different plans for remedying this bad condition, but these plans belong to the future. The mothers of our twenty-five babies are concerned with the present. What are they doing about the matter now? From these mothers I chose two as examples of women who have solved the problem so far as they are concerned. One is the woman whose baby cost the most, $314.50 (Budget 1), and the other the woman whose baby cost the least, $91.56. Their methods are entirely different—each has its drawbacks, each its advantages.

THE TWO TYPES

Mother number one, by leaving her baby for seven or eight hours a day to work at her profession, adds enough to the family income to allow generous expenditure on the baby. Mother number thirteen uses the same brains and energy on her job at home. They are both working women.

This purely economic discussion is not the place for consideration of whether or not it is wise for a mother to be separated from her child during the day. It is common among the very rich and necessary among the very poor. When the child reaches the school age the separation cannot be avoided. Every mother must decide according to her situation whether she had better add to the family income by earning money herself or by conserving her husband's earnings. The same qualities bring success in either case—brains and pluck, pluck and brains.

It is not enough for a woman to work, she must work intelligently.

These two mothers are neighbors, and each is interested in the steady, determined manner in which the other works out their common problem. Each says of the other: "I admire that woman. She is holding down her job."—[*From "Collier's National Weekly," by permission.*]

[It is unnecessary to state, that the Publication Committee believes that nothing is *saved* to the home by the withdrawal of the mother for money making. The care of the child by its own mother is the one big expense which a man in very limited circumstances can afford for his children. There are, of course, some few cases in which the mother is forced to earn money away from home. States are, everywhere, awakening to the fact that conditions necessitating this are too costly.]

XV

CHILDREN IN A GROWN-UP WORLD

JULIUS G. FURTHMAN

THE young philosopher (and he might be you or I) loves all children. He rarely ever tires of studying them. He watches them in many moods, from many cross sections of interest—on the street car, in the home, flung out and happy on the playground. One day he wrote the following:

A visitor from another planet, curiously examining our houses, streets, furniture and machinery, would not gather much evidence of childhood as a large or an important factor in human life. The answer to this is prompt and loud:

"Children belong at home. Look there, and you will see whether *they* are considered or not."

Indeed, let us look carefully. The average home is a house of, say, six rooms. This is a liberal allowance, applicable only to America. Even with us, in our cities, the average home is little more than a crowded tenement—only two or three rooms; and in wide stretches of country it is a small and crowded farmhouse.

Six rooms, then, is a liberal allowance—kitchen, dining room and parlor and three bedrooms. And, gazing upon the home from the outside, we see a building of dimensions suited to adults. There is nothing to indicate children there. Examining it from the inside, we find the same proportionate dimensions, and absolutely nothing in the materials or arrangement of the internal furnishings to indicate that children grow there, eat there, romp there.

The stairs are measured to adult tread, the windows to the adult eye, the chairs and the table to the adult seat. Only in a bedroom we discover a cradle—descended from who knows what inherited desire for swinging boughs—and, in some cases, a crib. In the dining room is often a high chair (made to accommodate the adult table) and sometimes in the parlor a low chair for the child. If the family is wealthy and careful, there is, perhaps, a low table, too; but the utmost that can be claimed for the average child is a cradle or crib, a high chair and a little rocker.

Still, comes the further answer, there can be no reasonable objection to this condition, so long as the child is considered merely as a member of the family. But that, mind you, is the pith and body of the argument. The adult family precedes and outlasts the child, and it would be absurd to expect them to stoop and suffer in a house built and furnished only for children. Of course. So we build for the adult only, and small legs toil painfully up our stairs and fall the more painfully down them.—[*Kansas City Star*.]

FOOD AND DRINK

QUOTATIONS

"What the average woman at the head of a home does not sufficiently grasp in all its importance is that the very center of the household—the most important thing in the home—is the spread table with a meal on it. Look at the church. It is by no accident or mere coincident that the central sacrament of the Christian religion takes the form of a common meal. It represents a universal fact of human life. The domestic table is really the pivot upon which the whole home turns."

"The mother who holds herself responsible for what her child shall wear, and yet does not feel that she is answerable for what he shall eat, shows that she regards his outer appearance more than his health of body or moral strength."—*Elisabeth Harrison.*

"A woman lived in a town where the grocery stores and meat markets were about as carelessly conducted, with regard to cleanliness, as they are in the average place. She determined to change things, and whenever she went to one of the stores she politely asked the clerk to put waxed paper, or any other kind of paper, on the scales before weighing delicate articles, and explained why. Of course he grudgingly complied, but he complied. Then the woman told her friends and neighbors how nice it was that at So-and-So's store things were weighed in this cleanly way. Of course, when the store people found that they were getting new customers as well as pleasing old ones, they discovered that cleanliness pays."—*Ladies' Home Journal.*

"Women can teach the mothers the ways of health, even with too many children; can interest the daughters and sometimes the sons in wholesome home pleasures, but to persuade the men to be wise in their fatherhood, this is the work for men. Who will show the way?"—*Annette Fiske.*

"Man has staked his all upon mind. The only physical development that is really worth anything to such a race is that which educates intelligence and morality, on the one hand, and serves for their expression, on the other. . . . It is necessary to be a good animal only so far as that state makes for being a good man."—*Charles W. Saleeby.*

"Isn't it queer that some people care more for what they eat than for how they feel? The degree of health produced by a certain amount of food measures its value to some, but the majority asks how it tastes. The question is not how much good is this food going to do me, but how pleasant it will taste for an instant while it is passing through my mouth.

"Another strange thing is that, although people know that rebreathed air is an active poison, many have a horror of pure air in their homes, and especially in their bedrooms.

"It is strange, too, that when a physician, in an entirely disinterested way, tells a woman that, in order to use all the lung tissues God has given her, she must make certain changes in her mode of dress, that in nine cases out of ten she will listen to the advice of her dressmaker instead."—*Journal of Public Health.*

"It is, after all, what a man determines for himself and for his family that affects both his views of life and his wish to secure for himself and for them that which he believes to be best. It is not what some other man believes for him that affects his life."—*Ellen Richards.*

"What shall it profit a child if he gain the whole world of knowledge and lose his own health?"—*G. Stanley Hall.*

"Preventable diseases are the common enemies of mankind; because this is true, it is everyone's duty to aid in the work of bringing them under control."

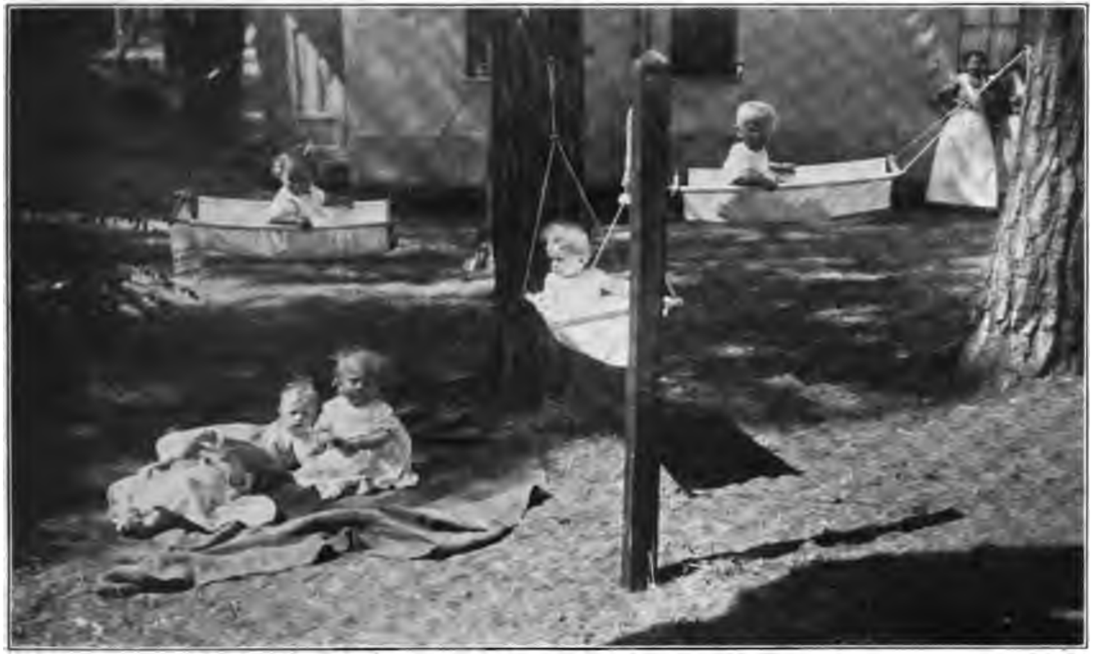
"We may do without food for weeks, water for days, but not air for minutes."

"Open air and exercise do more to make good blood and make it show in the glow of the skin than anything else the children may do."

"One Boston school committee has made a concerted attack on bad teeth, the essential features of which are the exaltation of the tooth brush, and concentration on the first grade: The momentous time with teeth being the coming of the sixth year molar."—*Joseph Lee.*

"Every truckman keeps his horses' teeth in order because he knows bad teeth mean a waste of food, poor condition and less work. Is not a child worth as much care as a horse?"—*New York Evening World.*

"Most of us parents fail to make clear to our children while they are growing up that the passing on of life from one generation to another is, for all right-minded persons, honorable, happy and acceptable. In experience, every well-mated parent among us knows this wholesome truth, yet, through timidity and custom, we leave children to find it out in a jumbled way. We all know that the life-giving power is the most wonderful, poetic, beautiful, mysterious power that man possesses. We should overcome the old custom now, and let our children know the beautiful truth and save them from ugly mistakes."



INEXPENSIVE HAMMOCKS FOR BABIES

From a Photograph from Life.

XVI

THE GOSPEL OF DRINKING WATER FOR CHILDREN

LOUISE E. HOGAN
Author of "Diet in Home and School"

Milk not a substitute for water

THE giving of water is one of the most important features of infant feeding. Many conditions require it, and it is healthful at all times, unless in rare stages of illness, when it might be forbidden by medical authority. It is not unusual to deprive infants almost entirely of water because they drink milk. The fact is overlooked that milk, though a liquid out of the body, becomes in the stomach a solid food, containing all the nutriment required for an infant's normal growth. Irregular action of natural laws is not infrequently a result of this deprivation, and can easily be corrected by the use of what appears to many to be an excess of water. A copious drink of water about an hour after the evening meal is an important feature in regulating a child's condition, and it should never be neglected, especially in summer.

Quantity of water necessary

A child, four or five years old, should drink at least half a pint of water between five o'clock supper and seven o'clock bedtime. The habit of drinking water both morning and evening can be cultivated with a little care and it is a habit of great influence upon sluggish conditions throughout the lifetime. That this fact is not fully appreciated is evidenced by the constant cry in the nursery for laxative medicines, which are used and advised far too frequently. It seems necessary to iterate and reiterate the facts connected with the use of water in infant feeding, as it is a feature that is too frequently underestimated. Many a child's suffering has been relieved by a few teaspoonfuls of boiled water that has been cooled (not iced), and given at frequent intervals during a hot day. This should be the rule, not the exception, from birth. Children a few years old need a great deal more; a pint a day is not too much for a five-year-old child, and during very hot weather, when perspiration is excessive, the need is even greater. A forty pound child should drink 20 ounces daily.

Ice water

The ice water habit is not to be recommended. It is at all time a source of mischief, and one of our national weaknesses in a dietetic way. It is not to be wondered at that children wish to follow the examples set by adults in this matter, but they must be taught to abstain. Boiled water, cooled on the ice and left covered in a convenient place within reach of the little ones, will soon be taken in preference, at home, with but little care upon the part of the mother to establish this habit.

Frequency of drinking water

A baby should be offered water six or seven times a day. For older children it should be remembered that water is needed according to activity and to bodily temperature—the greater the activity, the greater the need for water. Dr. J. P. Crozer Griffith, author of "The Care of the Baby," says: "It is a great mistake to suppose that every cry that stops temporarily when the breast is given denotes hunger. Often the child is thirsty, and a little water is what it really needs. This advisability of giving the baby water is very commonly forgotten. A nursing infant, although not actually requiring it, may well have water offered to it several times a day, at first from a teaspoon and soon from a glass or a nursing bottle. In summer time, more water is required, and especially as the baby grows older, when solid food is replacing liquid to a considerable extent." In speaking of the care of the sick baby he says: "An absurd and still too widespread idea is that a sick person must receive a limited amount of water. As a rule, and particularly in fevers, all the water that a child asks for may be given it, provided this does not take the place of nourishment." Often the promise of water as a reward will induce the taking of some food. Where, for any reason, the amount of water must be restricted, it will be found that a child will often be content with a small glass, provided it is allowed to drain it, while it would have clamored for more if permitted to empty a large glass only partially."

The office of water

Dr. Alfred K. Hills, editor of the "New York Medical Times," says that water not only helps to clean the stomach of its contents and aids in the digestion of food, but when taken up by the blood vessels aids in normal nutrition, removes effete matter, and relieves congestion. He says the refreshing draught of fresh, cool water should not be withheld from patients, that it should be constantly offered to them; that in acute catarrh of the stomach there is no agent which gives so prompt and durable relief as water, sipped as hot as it can be borne. Many cases of disordered digestion, he says, are due entirely to lack of sufficient water.

In the chapter on Laxative Foods in "How to Feed Children," I have given Dr. William Gilman Thompson's rules for preventing constipation, and he gives prominence to the use of water for this trouble. Bulk in food, an abundance of water and daily massage of the abdomen, will often cure the most stubborn case. If food is too concentrated, as in a milk, meat or egg diet, there is little waste, hence constipation often occurs. Sufficient fluid, and vegetable and cereal foods, which supply bulk, will tend to correct this trouble. Dr. Thompson also advises taking cooked fruits with a glass of water at the commencement of meals, as the effect upon the bowels is more marked if taken in this way.

When laxatives are given to a nursing mother, water should be given to the infant, as an aid, if the end in view is to correct constipated habits in the nursing infant.

The Greer rules

Edith Greer, author of "What Children Should Eat," prepared in the interest of *Child Welfare,* for parents, teachers, students, nurses and social workers, gives nuggets of information that can not help but make a mother think. I will quote those about our subject, and you will readily see how the basic thoughts advanced agree with what has already been said.

"Food is what is eaten. The body needs beside food, *pure water,* fresh air, sleep and exercise, to be able to use the food that is eaten.

"In summer children lose water from their bodies; in winter, heat. In hot weather they should therefore, be given more water; in cold weather more heat-giving foods, as starchy foods, milk and oil.

"Bathing the skin aids the body in disposing of waste products. A skin not cleansed becomes inactive and often diseased. Thorough and complete washing with warm water is needed at least once a day; for infants in the morning; for others at night.

"Water is needed in abundance. Upon rising and before retiring, a glass of water taken gradually, does for a child inside what bathing does outside. The need is no less. The effect upon the health may be even greater.

"Drinking water while eating deposits fat in the body.

"Disease introduces poisons into the system and retains in it those due to unremoved waste product. Water is therefore needed in increased quantity.

"Colds are due to unremoved waste products, vitiated air and exposure. Laxative foods and water are both preventive and curative. Laxative foods are a common need in health and may be in illness. Their use and water can, together, render medicines for this purpose unnecessary and make digestion vigorous and health secure.

"Nervous disorders are induced by neglect in removing waste products in the body. Water is again an important factor in this matter. Complete removal of waste products is absolutely necessary for the health of the child. Impure milk may kill a child and always injures it. Impure water does likewise."

An example

The importance of this subject brings to mind an instance where a physician was hurriedly called ten miles from home at midnight to see an infant, apparently very ill. He suggested giving the child some water to drink. It was done. The child slept and there was no further fever or difficulty of any sort. The mother said her home physician had never even hinted at the necessity for giving an infant water. This may seem incredible, but it is only too true that cases of this kind occur constantly. The physician takes it for granted that the mother's common sense would suggest the use of water, and, on the other hand, the mother waits for specific directions in every detail. Mothers would, undoubtedly, do much better if all direction for the nursery were made simple and more clear by those who are in a position to speak authoritatively.

XVII

FOOD AND CARE FOR OLDER CHILDREN

FLORA ROSE
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TO realize the significance of an understanding of the right way to feed children, it is necessary simply to turn to some of the recent bulletins on the feeding of animals. The writer has in mind one bulletin that gives the results of experiments in feeding growing swine. The kind of food given to them during their growth period was found to affect greatly the size and strength of the bones, the vigor and amount of muscular tissue, the size and activity of the lungs, kidneys, and liver, total growth and weight, and ultimately the ability to produce healthy offspring. So, after all, Providence is not altogether responsible for our physical defects.

Solid food must be adjusted to the child's increasing digestive powers

The feeding of the baby during the first nine months or year of its life is so important to its future that under normal conditions nature is not willing to let us experiment with it, but cares for it herself by providing mother's milk. This first year is the time when the baby's digestive powers are being made ready for use. Toward the end of the year the healthy, human digestive apparatus is ready to begin its more exacting education. It now needs training by carefully chosen exercises. It would be absurd and unwise for us to try to hamper the year-old baby in his attempts to crawl or walk or otherwise use his strengthening muscles. It is equally foolish to limit the diet of the normal year-old child to milk only. He is instinctively ready to begin the active use of his muscles, whether of locomotion or digestion. On the other hand, these are functions which are by no means fully developed. Are we going to demand greater feats of the muscles of digestion than of the arm and leg muscles? The underlying principle of child feeding should be to *develop* the child's powers of digestion, and neither to retard nor to overtax them. If child labor is to be discouraged it must be discouraged in the less apparent but equally real form of making a child's immature digestive apparatus do grown-up service. The two mistakes most often made in feeding children are: (1) Giving foods unsuited to the stage and age of development; (2) Permitting children to eat between meals and at irregular hours.

The baby just weaned is not immediately ready for a very varied diet of solid foods, although it has established its ability to digest starch and has increased its ability to digest the other foodstuffs. These powers should be tested a little at a time and the burdens imposed on them should be gradually increased. The first starchy food given to a baby is cereal gruel mixed with its milk, later cereal jelly and unstrained cereal, and then bread crumbs and bits of crust or zwieback or tough educator crackers to develop its power of mastication. Strained fruit juices are given first, then fruit pulp and cooked mashed fruit, and finally the fruit itself. Meat broth and meat juice precede the use of scraped meat, and this precedes meat which is finely cut. Vegetables are mashed, bread is crisped, cereals strained, meat scraped or cut fine, until the child has some grinding teeth and is old enough to obey the command to "chew." The child should be trained to digest fat by giving it, first, rich milk, then thin cream, then butter, and lastly other solid fats.

This idea of gradually increasing the strength of the food to be digested as the child grows and develops should be carried out all through childhood. If more thought were given to this there would be little need in later life to discuss the digestibility and indigestibility of various foods. A sound, well-educated stomach would be able to stand the wear and tear of the every-day diet. Certainly we should learn to digest foods that require real work on the part of the digestive organs, but this should come gradually. It is all very well to say that Jane or John is a perfectly vigorous child and already at two or three years of age shares the family dietary in all particulars. Do the grown-up Janes and Johns exhibit such sound health as to justify us in our belief that the vigor has endured?

Much of the trouble that is laid at the door of teething and most of the difficulties feared during the baby's second summer are due not to teeth and time, but to wrong feeding methods. The child's first summer is in point of fact more perilous than the second, but usually during the first year it is living on a carefully regulated diet and all the digestive processes are proceeding normally. During the second year, when foods other than milk should of necessity appear in the child's diet, unwise choice of foods is made and digestion is disturbed. Cutting teeth adds to this disorder and the time becomes one to be feared by the mother and suffered by the child.

List of dietaries to seventh year

The following list of dietaries is given as a guide to aid in a wise choice of food for the child up through the seventh year. It is intended to be suggestive and to illustrate types of food for different ages, and does not pretend to cover all the foods which may appear in the child's dietary during these years. The actual dietary as prepared and served to the child must be a matter for individual adjustment and requires the practice of much sound common sense.

DIETARY FROM 12TH TO 18TH MONTH

First Meal. 6—7 a. m.

Warm milk mixed with a little thick cereal gruel or cereal jelly

or

A little lightly cooked egg mixed with stale crumbs, and a glass of warm milk.

Second Meal. 9—10 a. m.

Glass warm milk.

Third Meal. 1—2 p. m.

A lightly cooked egg mixed with stale crumbs, glass of warm milk

or

Tablespoonful of thoroughly mashed potato with meat juice, glass of warm milk.

Fourth Meal. Midway between meals.

One or two tablespoonfuls orange juice or prune juice. (This meal may be given at nine o'clock in the morning instead of at this time.)

Fifth Meal. 5—6 p. m.

Glass warm milk with cereal jelly.

DIETARY FROM 18TH TO 24TH MONTH

First Meal. 6—7 a. m.

Warm milk with lightly buttered bread

or

Cereal with thin cream, glass of warm milk

or

Lightly cooked egg, lightly buttered bread, glass of warm milk

Second Meal. 10 a. m.

Glass of milk with slice of bread.

Third Meal. 1—2 p. m.

Mashed potato with dish gravy, bread and milk, very small serving baked apple or prune pulp

or

Lightly cooked egg, bread and milk, small serving baked apple or prune

or

Mashed spinach, carrots, or similar vegetable, bread and milk, small serving very simple junket or rice pudding or similar simple dessert.

Fourth Meal. Midway between meals.

Tablespoonful orange juice or scraped apple.

Fifth Meal. 5—6 p. m.

Bread and milk

or

Milk toast.

Although the child may be at the family table from about the third year, it should not be allowed the freedom of the family dietary. It is far better for the child to learn that certain foods are not for its consumption, and that they are actually as remote from its scheme of things as the moon. There is no better lesson in self-control or temperance than the one that may be taught in this simple way.

DIETARY FOR THIRD YEAR

First Meal. 7—8 a. m.

Cereal with cream, milk to drink

or

Lightly cooked egg with toast and milk.

Second Meal. 10—11 a. m.

Bread and milk.

Third Meal. 2 p. m.

Lightly cooked egg, buttered baked potato, bread, milk, stewed fruit

or

Broiled scraped beef, mashed vegetables, as spinach, puree of peas, or carrots, bread, milk, light pudding, as rice or bread pudding or junket, or occasionally a simple ice cream

or

Bread and milk, baked potato and one other vegetable, small serving of pudding.

Fourth Meal. 6—7 p. m.

Bread and butter, milk

or

Cereal mush and milk

or

Bread and milk and stewed prunes or apple sauce.

DIETARY FOR FIFTH YEAR

Breakfast. 7—8 a. m.

Cereal with sprinkle of sugar and cream, bread and milk.

An egg may be added to this meal.

At 10 a. m.

Milk with thin slice of bread and butter.

Dinner. 12—1 p. m.

Lightly cooked egg or finely cut meat, spinach or peas or beans well mashed, baked potato or boiled rice, stewed fruit or light pudding.

Supper.

Well-cooked cereal with cream, milk to drink, stewed fruit

or

Lightly cooked egg, bread and butter, milk to drink, baked apple.

DIETARY FOR SEVENTH YEAR

Breakfast.

Cereal with sprinkle of sugar and cream, eggs, poached, boiled, or scrambled, milk with bread and butter. Fruit may be eaten at this meal.

At 10 a. m.

Glass of milk and a cracker.

Dinner.

Small piece of steak or roast, potato, rightly cooked cabbage or other vegetable, bread and butter and milk, some simple dessert as custard, bread and jelly, or fruit.

Supper.

Eggs or cream soup or milk toast, bread and butter, milk, stewed fruit or bread and jelly.

The above dietaries may be greatly simplified, but should hardly be made more complex. Such simplification has been fully explained in a bulletin on Human Nutrition.* During the early years of childhood, fried foods, pastries, hot breads, heavy puddings, strongly flavored vegetables, much meat, candies, and the like should find scant place in the diet. Tea and coffee or other stimulants should never be given to children.

Milk All through childhood, milk should be a mainstay in the dietary. The complaint is often made by mothers that their children do not like milk and will not take it. Inquiry generally shows that the cause for this has been the use of quantities of very sweet or highly flavored foods. The distaste is generally a fancied one. The cases in which a child has some persistent disability to digest milk are very rare. If the child has been permitted to become notional in his food habits and he will not eat raw milk, some way should be found to include it in the dietary. This can be done through the use of milk soups, weak cocoa, custards, cereals cooked with milk, and simple puddings. All the milk needed by the child may be concealed in this way.

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*Cornell Reading Courses, from which Miss Rose's articles are taken by permission.

The child's sense of taste easily dulled

The child's sense of taste is very highly developed. It derives much more flavor and "taste satisfaction" from such bland foods as milk and cereals, and from simple bread and butter, than does the adult. If strongly flavored foods are constantly given to the child its keen sense of taste becomes dulled and it soon loses pleasure in simple fare.

The use of sweets

The question is constantly asked, is not the child's natural fondness for "sweets" an indication of its need for candy or sugar? A certain amount of sugar in the child's dietary is certainly a very desirable way of supplying some of the child's energy. But this sugar may be supplied best in the form of milk, in sweet fruits and vegetables, in fruit jellies, and in well-sweetened simple puddings, with only occasional pieces of candy as a 'dessert at the close of the meal. All the sugar a child needs can be included with other foods at meal time without the necessity of the too common between-meal indulgences. If a child is allowed to eat candy, cake, and quantities of sweet crackers between meals, the appetite constantly accustomed to the stimulus of the sweet food becomes vitiated. As a result, the meal-time becomes a farce. "Not hungry," is the complaint. Muscles, nerves, blood, and bones, which need all the things that only such foods as milk and eggs and cereals and fruit are able to supply, become badly nourished and the child is not the rosy, wholesome, sound-sleeping, rightly-developing mortal intended by nature.

If a child is very active it is a simple matter to increase the sugar in its dietary without giving candy between meals. Sugar may be allowed with cereal or in bread and milk. Sweet jellies may be given to the younger children at some meal and preserves to the older ones. Simple desserts and cooked fruits may be well sweetened. Then the child eats the others foods along with the sugar and the diet is not a one-sided affair. When we say that constant candy eating results in poor teeth we are describing a more deeply seated evil than we realize. If poor teeth are caused by too much candy, it is usually because the use of the sugar has so satisfied the child's appetite that it has been unwilling to include the blander bone-building materials in its diet. If the teeth are affected as a result, what about the harmful effects on the more obscure tissues which are hidden from us? Concentrated sugar solutions are very irritating to the mucous membranes and may give rise to gastric disorders, hence the further desirability of having the sugar used in the dietary diluted with other foods.

The question of meat

Some of the men most learned in the conditions best for little children believe that the use of meat in the dietary of the child until after the fifth, sixth or seventh years is not advisable. The main reasons given for this are: Meat is more subject to decay in the intestines than other protein foods. Clean, wholesome milk tends to prevent this decay. Meat contains stimulating substances which, though they may be of use in the older organism, are not needed by the younger one. The baby or child should be vigorous enough not to need any stimulant. These substances give rise to waste products in the tissues which, though they may not be directly harmful, are certainly not beneficial to the child. The kitten is often cited as an illustration of this principle. While cats live healthily and well on a rich meat diet, if kittens are fed largely on meat they become subject to convulsions. Meat is a highly flavored food. A diet rich in meat is likely to be a diet poor in milk, for the higher flavor tempts away from the milder one. Such a diet may be deficient in lime.

Some physicians believe that it is an unwise practice to eliminate meat from the child's diet, because meat is a useful source of iron. An intelligent knowledge of foods soon shows how this disadvantage may be overcome by using eggs and certain vegetable foods relatively rich in a form of iron more available than that which occurs in meat. Meat has one decided advantage in that it necessitates the use of the powers of mastication.

The importance of attractive serving

It is impossible to overestimate the importance of serving food in an attractive manner. Food may be of the right kind, carefully prepared, may be clean and wholesome and good, but at the last it may be presented in such a way as to appeal neither to eye nor to appetite. If a child does not like food which the parent knows to be desirable, the dislike may generally be conquered by a modification in the way the food is served.

Two little girls of the author's acquaintance would not eat baked potato until its commonplaceness had been removed by having wonderful rills mounded up the side with the tines of a fork. The change in taste caused in this way was very real to them and they clamored for more and more. A little imagination on the part of the parent will do much to make John and Jane eat bread and milk and find therein the flavor of nectar and ambrosia. But the bread and milk must be as daintily served and as attractively presented as any more elaborate feast.

Mastication It is important that a child should learn to masticate its food well, and to this end it should have something to chew as soon as the large back teeth begin to come. Tough bread, zwieback, educator crackers, and, later, some meat are useful for this purpose. All of these things develop the powers of mastication and give the exercise necessary to develop the jaw and make room for the second teeth.

Eating between meals Again let emphasis be laid on the bad habit of allowing children to eat between meals. It results in no good to the child and must be strongly condemned. If a child is habitually and really hungry between two definitely established meals, shorten the interval between the meals, or give more food at the meal, or establish a simple meal of bread and milk at a regular time between the two meals, or allow him to eat dry, unbuttered bread. If dry, unbuttered bread is given, it will be found that the between-meal habit exists frequently more because of a desire for something good to eat than from actual hunger. Learn to distinguish between habit and hunger. It is a duty which parents owe their children and if it is neglected the child may finally pay the price.—[*From a pamphlet of the New York State Agricultural College, sent free to those living in the state.*]

ORTHOPEDIC EXERCISES FOR CHILDREN KEPT BACK IN THEIR STUDIES TO GAIN TIME FOR PHYSICAL DEVELOPMENT

XVIII

CONSIDERATIONS WHICH SHOULD GUIDE IN THE CHOICE OF FOOD

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Avoid fads

THE first precept in regard to the food of children is to avoid fads. There are plenty of popular delusions in regard to diet, and scientific men themselves are not always free from them. There is scarcely an article upon our tables which has not been condemned by some one in the name of hygiene. All kinds of animal food are forbidden by many. Every vegetable, perhaps, has been tabooed by some one, and a recent writer points out that cereals are likely to produce fermentation.

Everywhere we hear of the merits of graham bread, whole wheat bread, and the like. I know a teacher who lost her position, and the special charge against her, I understand, was the sin against hygiene of eating white bread, but Sir Lauder Brunton shows that brown bread produces gastritis. Salt is said to be injurious. Spices are harmful, the tomato causes insanity and other evils, and fruit is not without its dangers.

Many say we eat too much; others that we are underfed. One school condemns every kind of cooked foods; Metchnikoff, the great Russian scientist, on the other hand, maintains that we ought to boil our strawberries. Some find it an advantage to eat five times a day; a large class find their health by eating no breakfast; and the extreme Fletcherite believes that it does not matter whether we eat anything or not if we only chew it enough. Obey all the prohibitions, and you will probably fast and perhaps starve. Follow all the positive recommendations and you will be likely to have your hands full, your stomach disordered and your mind distracted. The latter plan, however, is safer than the former.

Give great variety

The second precept is to give children a great variety of food. When a child has reached school age it is usually better for him to eat meat, fish and eggs, vegetables, fruit, cereals, and these in variety, than to be confined to any one limited diet. Chickens fed upon one thing are likely to become ill and may die, and many other animals—probably all—thrive best on a mixed diet.

The child is no exception; and in many cases the habit of eating many different foods is likely to save the individual from numerous ills when conditions of health or one's surroundings make it unwise or impossible to use certain kinds of food.

Food must be absolutely clean

The third precept is the need of absolute cleanliness in all food for children. If it were possible to furnish all children in our cities with clean milk, the death rate, especially of young children, would be enormously decreased.

Among infants the number of deaths is usually three or four times as great during the months of July and August as it is at other times in the year. The late Dr. Harrington of the State Board of Health in Massachusetts studied this matter extensively and believed that this increase in the number of deaths is due to diarrheal diseases caused by dirty milk; and experiments in feeding children with clean milk in Rochester, Worcester and other cities have shown excellent results.

It is of the first importance to have cleanliness in the food for young children; and when children arrive at school age, while they are not as likely to be killed by dirty food, they are very likely to be made ill by it. To insure cleanliness in the food of school children is a very difficult matter. Even if the food itself be clean, the children, unless most carefully trained, have astonishingly dirty hands, and the temptations to indulge in food that is not clean are many. The fruit vended on the streets is likely to be dirty. Peddlers of candy, ice cream, or the like, surround the schoolhouse, and such confections are very likely to be dirty. And again the habits of children, fostered by some of the inventions of the confectioners, such as "all-day suckers" and chewing-gum, offer many temptations. But, however difficult the task, mothers should make every effort to give their children only food that is clean, and train them to obey the first commandment of hygiene, which is to be clean in everything.

Food that is liked

The fourth precept is to follow nature and give children the food they like. Modern studies have shown that digestion waits on appetite, and that one of the conditions of any kind of food being wholesome is that we should like it. Studies upon dogs made by the great investigator, Pavloff, have shown that the mere liking of the food stimulates the flow of the juices in the stomach necessary for digestion. We have every reason to suppose that the same is true of human beings, and that dislike for a thing is a sign that we should not eat it. Modern science has shown also such great differences in people that what is one man's meat is another man's poison, and hence that, in cases of doubt, it is best to leave children to their own instincts and by all means not to force food, however wholesome it may be supposed to be, upon an unwilling stomach. Sometimes a child, from some peculiarity, can not eat a very simple and ordinarily wholesome food without distress. I know, for example, a boy who can not eat eggs in any form; even when cooked in cake they will make him ill; and not infrequently other innocent forms of food are distinctly injurious to some children.

The great number of errors prevalent in regard to food have naturally influenced the diet prescribed for children. Because a food is supposed to be nutritious or healthful for an adult, or easily digested, it has been deemed a good food for children; and things injurious to many adults, like sugar, meat, peas, beans and raw fruit, are likely to be deemed injurious to children. The result has often been that children were forbidden what their normal appetites craved, and required to swallow great quantities of potatoes, oatmeal or other cereal that they ate with disgust as a sort of penance, that they might afterward have what they craved.

Food must be chewed

The fifth precept is that children should be taught to chew their food. There is a German proverb to the effect that half of digestion is done by the teeth, "*Gut gekaut ist halb verdaut.*" The importance of chewing one's food properly can hardly be realized by those who have not especially studied the subject, and the importance of sound teeth that one may chew one's food can not be overemphasized. From the point of view of health the words of Cervantes are true—that a tooth is more valuable than a diamond.

At the time when children enter school they are likely to be losing their baby teeth, and hence digestion is very likely to be affected by the decaying teeth that poison the food. These teeth should be carefully attended to, filled when necessary, and pulled out at the proper time. Although it is hard for children at this period to chew their food, nature has taken the precaution to provide them in the sixth year with the best teeth for chewing purposes that they ever get, the so-called sixth-year molars. Unfortunately many parents mistake these teeth for baby teeth and let them decay, but the best care should be taken of them as well as of the other teeth that follow.

So important are good teeth for digestion that every child should be trained to take care of his teeth and should be shown the luxury of a clean mouth. Even the best of children are not born with tooth-brushes in their mouths; and if they were they would have to be taught to use them. Here is a case where every child needs a sort of military training.

When our soldiers, on account of the heat in Cuba, had thrown away their baggage and even their clothes, a British officer who was with them marveled as he saw a regiment march by, each soldier with a tooth-brush twisted into the band of his hat. Thus children should be taught that a tooth-brush is an essential article of the toilet—the last thing that they should use at night and the last thing that they should throw away.

Foods to be avoided

Sixth, a few things should be avoided. If children are given a variety of food, if the food is always clean, if it is properly cooked, if it is thoroughly chewed, and if they are given what they like, there is little danger of indigestion; and yet a few words of caution should be uttered.

First of all, stimulating foods and drinks are not intended as good for children. Tea, coffee and especially all alcoholic drinks, should be forbidden. Rich and highly spiced food, pastry, most meat sauces, relishes and pickles should be avoided. Greasy foods, pies, fried cakes, fried potatoes, and the other products of the frying pan, should all be looked upon with suspicion. Fat is needed by children, but it can be given in the form of milk, cream, pure butter, fat meat, and the like; but heated and mixed with uncooked starch, as in certain gravies and pastries, it can not be digested.

Digestion needs a peaceful mind

Finally should be mentioned the importance of the mental factor in digestion. Fear, worry and distress of thought are likely to retard digestion; and serenity of mind and orderly attention and association favor it. The meal time should be a pleasant time. "Better," from the point of view of hygiene as well as of morals, "is a dinner of herbs where love is, than a stalled ox and hatred therewith."

However hard one's lot, and however many one's woes, for the short space of meal time one should be cheerful, and disagreeable things should be put aside. Punishment of children, rebukes and even criticisms and everything unpleasant should be postponed if possible; and children should be trained to feel that disagreeable and unkind words or acts at meal time are especially grievous faults. In short, for the sake of digestion, if for no other reason, the brief hour of the American meal should be sacred to good fellowship, social enjoyment and domestic felicity.—[*From The Delineator, by permission.*]

XIX

HOW TO PLAN THE DAILY MEALS OF SCHOOL CHILDREN*

CAROLINE HUNT

Author of "Home Problems from a New Standpoint"
(A reference paper)

A day's menu for a child of 6 to 9.

(One-half that of the adult)

Breakfast:
- Orange of medium size.
- Cooked oatmeal, one-third cup.
- Milk and cream mixed, one-half cup.
- Toast, 1 slice.
- Butter, one-half cubic inch.
- Milk to drink, 1 glass.

Dinner:
- Whitefish, 3 ounces as purchased, or 1½ ounces edible portion.
- Potato, 1 small.
- Celery, cooked in milk, three-eighths cupful.
- Bread, 1 slice.
- Butter for bread and potato, 1 cubic inch.
- Rice pudding, one-half cupful.

Supper:
- Egg.
- Toast, 1 slice.
- Butter, one-half cubic inch.
- Milk, 1 glass.
- Prunes, 3 cooked with one-half level tablespoonful of sugar.
- Cookies.

The weight and composition of the various articles of food in this bill of fare are given in the following table:

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*From U. S. Bureau of Education Bulletin 408.

TABLE I

Article of food	Weight	Components				Calories
		Proteins	Fats	Carbohydrates	Mineral matter	
	Ounces	*Grams*	*Grams*	*Grams*	*Grams*	
Milk	18½	17	20	25	3.7	376
Cream	1¼	1	7	1	.2	71
Fish	3	9	2	....	.6	61
Bread	3½	9	Trace	52	1.1	266
Egg	2	7	5	....	.5	79
Rice pudding	4	5	5	24	.9	165
Rolled oats	½	2	1	10	.3	58
Cookies	½	1	2	11	.1	68
Potato	2	1	Trace	11	.6	48
Prunes	1¼	1	......	21	.7	90
Celery	2	Trace	Trace	2	.5	11
Sugar	¼	....	......	7	.0	29
Orange	4	Trace	Trace	10	.4	43
Butter	1¼	Trace	30	....	.1	282
Total	44	53	72	174	9.7	1,647

The above dietary is not given for the purpose of recommending any of the specific foods as pre-eminently healthful or digestible, but rather as a means of so interpreting the statement that the average child of from 6 to 9 years eats 50 grams of proteins and 75 grams of fat and 175 grams of carbohydrates that it may be made the basis of discussion. The amounts of the various food materials in the dietary give as nearly the amounts of nutrients mentioned as any that could be described without going too much into detail.

SUGGESTION I

Suggestions for feeding children, based on Table I.

Become acquainted with the approximate composition of some of the very common foods, for example, milk, meats as a class, and cereals. For this purpose a bulletin for sale by the Superintendent of Documents, Government Printing Office, Washington, for 5 cents, is the best aid. Learn to classify these foods roughly into 3 divisions, putting into one division those rich in proteins, into another those useful chiefly as fuel, and into a third those which contain little besides water. Note (1) that in Table 1 the milk, fish, and egg provide 33 grams, or 62 per cent of the proteins, but only 509 calories, or 31 per cent of the fuel, leaving only 38 per cent of the proteins, but 69 per cent of the fuel, to be provided by other foods. These foods, and with them the meats, chicken, cheese, and dried beans and peas, fall in the class of those rich in proteins. Note (2) that the bread, butter, cream, rolled oats, potatoes, cookies, prunes, and sugar provide 912 calories, or 56 per cent of the fuel, and only 15 grams or 28 per cent of the proteins. These foods fall in the class of fuel foods. With them belong all cereals, breads, cake, honey, and preserves. Note (3) that the oranges and celery, though weighing 6 ounces and constituting 14 per cent of the total weight of the food, contain no appreciable proteins nor fats, only 12 grams or 6 per cent of the carbohydrates, and furnish only 54 calories or 3 per cent of the fuel. They belong to the class which even if eaten freely make no large additions to the dietary. In this class fall also most green vegetables and watery fruits.

SUGGESTION II

Know in a general way how much protein material a child of a given age requires. This is 40 grams for one between 2 and 5 years of age, 50 grams for one between 6 and 9, and between 50 and 100 grams for older children. See that the child gets two-thirds of this amount from milk and eggs, or from milk, eggs, and other animal food, remembering that a glass of milk contains about 8 grams of proteins, an egg about 7 grams, and an ounce of beef (without waste) about 5 grams. A child of from 6 to 9 years would get two-thirds of the proteins he needs daily, i. e., 38 grams, from 1 egg and 3 glasses of milk. The other third will in the case of the normal child be secured from the bread, cereals, and vegetables which it can be depended upon to eat.

SUGGESTION III

Exclude from the child's diet all "made dishes," rich sauces, salads, and fried foods. Limit the fat to that secured from milk and eggs and from the butter and cream used at the table. If this course is followed there is little danger of serving too much fat. The importance of this injunction can not be overestimated. The objections to such foods as pastry, fritters, escalloped dishes, and rich salads are three: First, they introduce the most indigestible substances into the diet, heated fats and other foods thoroughly mixed with heated fats. Second, it is impossible to use such foods without introducing much more fat than is thought best even by those who make liberal estimates. I have not uncommonly found the fat running up to twice the amount suggested by any student of dietetics as desirable in a bill of fare that seemed quite ordinary. This was due to the use of butter and other fats in cooking and of salad oil. Third, the use of complicated dishes makes it almost impossible to get even an approximate idea of the fat that is being served without long calculation, while with plain unmixed food materials the problem is quite simple. Note that in our bill of fare the milk and egg furnish 24 grams of proteins and 25 grams of fats. In selecting the amount of these foods that would assure two-thirds of the proteins needed we would therefore get an equal amount of fat. The 3 glasses of milk and 1 egg suggested above provide about 35 grams of fat. It is necessary therefore only to see that the child's bread is well buttered and very nearly the necessary amount of fat is provided, or if we wish to calculate more closely we may count 10 grams of fat to each glass of milk, 45 grams to a glass of cream, and 5 grams to an egg.

SUGGESTION IV.

Do not try to limit bread and cereals, except when it takes sugar to make them acceptable. Limit sugar to small amounts taken after meals in desserts or in the form of candy. If instead of sweets, zwieback is given when the child is hungry between meals, and no sugar is used on cereals, there is little danger of the carbohydrates running too high.

SUGGESTION V.

Do not forget to give the child fruit and vegetables every day. If eaten at meals there is little danger of giving too much of this kind of food, providing it is fresh and properly prepared.

SUGGESTION VI

In enlarging the dietary from time to time as the child grows, make no experiments. Do not ask yourself, "Why not give it?" but "Why give it?" If you do this you will exclude not only all foods which are notoriously indigestible, but also foods about which a suspicion hangs. The suggestion applies not only to the selection of food materials, but also to the methods of preparation.

The enlargement of the dietary as the child grows

The foods in all of the three classes, the proteins, the fats, and the carbohydrates, must of course be increased in amount as the child grows. There must be more milk and eggs, more bread, cereals, and butter, and more fruit and vegetables. While the quantity of each must be increased, the variety may be. There is usually, however, too much anxiety to increase the variety both of the foods and of the methods of cooking.

Increase of nitrogenous foods

When a child is weaned he changes a food which contains 2¼ per cent of proteins for one which contains 3 1-3 per cent. This step must be taken gradually and for some time after cow's milk of full strength has been given there is no need to add to the variety of nitrogenous foods. By the time the child is a year and a half old a very soft boiled egg may be given. Some physicians recommend the early addition of scraped meat. Considering the fact that the child can, up to the age of 9, get all the proteins he needs from 4 glasses of milk, 1 egg, and the bread and cereals he takes, there seems little reason to add meat to his dietary.

Milk

Milk may be given as a beverage and also in the form of milk soups and gravies. Here the question of the method of preparation arises. The quick method consists in heating flour in butter and adding the hot liquid. There lurks, however, about this method of preparation a strong suspicion of indigestibility, and a much safer way for the child's food is to mix the flour with a little cold milk and add it to the remainder of the milk which has been heated. Butter, if used at all, is added just before serving. Two level tablespoonfuls of flour to a cupful of milk make a sauce thick enough for milk toast, to mix with codfish or chipped beef, or to pour over vegetables. If one-half a tablespoonful of flour is used we get the right consistency for a thin milk soup. This may be flavored with such vegetables as onions, peas, cauliflower, asparagus, or tomatoes, small amounts of which left over from a previous meal may be thus utilized. A small amount of grated cheese may also be used for flavoring.

The amount of milk in the diet may be further increased, if necessary, by cooking cereals in milk and by the use of junket, baked milk pudding, and such puddings as the old-fashioned rice pudding and poor man's pudding, in which equal parts of cereal and sugar are baked with 12 times their volume of milk. For example, one-third cupful of sugar, one-third cupful of rice, and 1 quart of milk.

Eggs

Eggs should be poached or soft boiled rather than fried or served as omelets. If eggs are kept in hot water twenty to forty minutes, the yolks become mealy. They can in this form be sifted over milk toast or seasoned and spread on bread. The whites are much less digestible; if used, they should be chopped very fine.

Chicken, preferably the white meat, which has a short fiber, and those fish in which there is little fat mixed with the muscle fiber, like trout and white-fish, may be added to the dietary after milk and eggs.

Dried beans and peas are highly nitrogenous. If served with their skins, however, they are indigestible. Purees which preserve the more nutritious part and reject the skins may properly be given to children.

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Milk toast

In the preparation of milk toast the bread should be slowly heated until the outside is an even golden brown and the inside is dry. Every dish used in serving should be hot. One of the most satisfactory ways is to put the hot milk into a heavy-heated pitcher and pour it over the toast at the table. If the milk is thickened it can be allowed to stand on the toast for a longer time.

Sweets for children

If we use the word "sweets" instead of the word "dessert," we separate a class of foods like jams, stewed fruits, cookies, whose chief ingredient is sugar and which constitute a very legitimate part of the child's diet if given at the right time, from pie, doughnuts, and fritters, which contain a large per cent of cooked fat and are therefore more difficult of digestion. The amount of sugar in our typical menu is 21 grams (7 in the prune sauce, 9 in the rice pudding, and 5 in the cookies), or three-fourths of an ounce. This would amount to 17 pounds a year. This amount could probably be inceased by half without injury, particularly if the fat were reduced. Seventeen pounds for a child of 6 to 9 years would correspond to 34 pounds for an adult. Perhaps the best way to regulate the sugar supply is to set a limit to the amount of sugar used in cooking for the family, 34 pounds a year for each grown person and a corresponding amount for the children (see Table 1), and then give the child one-half ounce daily in the form of sugar or pure candy.

Nutritious puddings

Such desserts as rice pudding, custards, ice cream made with custard, and junket, should hardly be classed as sweets. Note that in the rice pudding the proteins are one-seventh of all the nutrients, while in the prunes and sugar they are only one twenty-ninth, and in the cookies one-fourteenth. As given above, rice pudding is an almost perfectly balanced food. The same may be said of poor man's pudding made with corn meal in place of rice. Junket is also a balanced ration rather than a sweet, while custard made with 4 cups of milk, 6 eggs, and one-half cup of sugar, should be ranked with the tissue-forming foods.

Increase in fruits and vegetables as the child grows

The importance of fruits and vegetables can not be overestimated. The fruits should be given first in the form of fruit juices, scraped apple, and the pulp of baked apple. Later stewed fruits and thoroughly fresh and ripe, but not overripe, raw fruit may be added. Prunes are a good food and invaluable in the cure of constipation. They should be thoroughly cooked in water alone, the sugar being added after the skins are soft. Bananas offer a great problem. They are usually half ripe and contain starch. They are therefore hardly fit to eat raw. Besides this, their consistency is such that they are likely to go into the stomach in large pieces. It is a wise mother who can succeed in eliminating them from her children's bill of fare, particularly in cases of weak digestion.

Cooked versus raw fruits

There is no doubt that safety lies in cooking most of the fruits that are served to young children. Of course circumstances must be taken into consideration. To a healthy child with no tendency to intestinal disturbances raw fruits offer few dangers, particularly in cool weather and at times when there are no prevailing epidemics. If there is a tendency to looseness of the bowels, however, no raw fruit should be given.

The palatability of freshly cooked fruit is probably underestimated, partly because the fruit is often poorly prepared, and partly because it is associated in the thought with canned fruits.

Cooking fruits

Prunes.—Prunes offer an example of a fruit that is frequently poorly prepared, being insufficiently cooked and served in a watery liquid. If cooked in the way mentioned above the prunes become soft and rich and the juice is like a jelly. The same method, consisting in long cooking in water only and the addition of sugar only after the skins are soft, should be followed in the cooking of all dried fruits. Prunes or other dried fruit cooked in this way may easily be spread upon bread for the school luncheon.

Apple Sauce.—There are few dishes which are oftener poorly prepared than is apple sauce. A syrup should be made with two level tablespoonfuls of sugar, or one rounding tablespoonful, for each apple, and the same amount of water. After it has been boiled for a short time, the apples cut into eighths or smaller pieces should be added a few at a time and cooked until soft and transparent. By this means the apple retains its form and the juice is so thick as to cling to the fruit after cooking. The difference in taste between such apple sauce and the mush which is often served by that name is very great and should be noted because of the value of apples in the diet. Well-made apple sauce can be carried in a cup in the lunch box with little danger of spilling.

Freshly cooked fruits

Freshly cooked fruits—berries, peaches, and pears for example—are a neglected item of diet considering their safety, wholesomeness, and palatability. They suffer, of course, as noted above, through being associated with canned fruits. There is, however, no comparison between canned strawberries and the same berries immediately after cooking. The time for eating cooked fruit is in its season. For example, we like apple sauce and baked apples in the winter, but would object to canned apples in June. It may be a hardship to have to eat our strawberries cooked, but it is not nearly so much of a hardship in their season as it is in the winter. The use of freshly stewed fruit in the place of raw fruit in summer would probably greatly reduce the amount of intestinal difficulties. Stewed fruits with rice and milk make a wholesome supper.

Figs and dates

These may be eaten raw, but should always be carefully washed and then heated enough to destroy any bacteria there may be upon them. The heating immediately following the washing usually improves them by making them puff up and soften a trifle. Stewed figs or dates may be served with boiled rice for dessert.

Vegetables

The first vegetable to be given is baked potatoes. These may be served with salt alone or with milk or cream and salt. Later boiled or creamed potatoes may be given, but fried potatoes are unwholesome. It is easier to tell what vegetables should be omitted than what ones should be given. The vegetables that are commonly eaten raw—celery, cabbage and radishes—are unsuitable for young children. Lettuce, if young and fresh, may be a valuable part of the diet of the child that can masticate well. Corn is questionable, because of the difficulty of masticating. Some physicians do not allow carrots, turnips, or parsnips. Considering, however, the value of vegetables as food, it is perhaps more necessary to see that those which are served are fresh and thoroughly cooked and not served with rich sauces or fried than it is to try to avoid any special kinds.

Mineral nutrients in children's diet

There is probably no subject connected with dietetics upon which a larger number of unfounded statements have been made than upon the subject of mineral matter in food. For this reason I quote directly from Doctor Mendel's "Childhood and Growth":

"I have already referred to the peculiar importance of the mineral nutrients for the proper development of the body, in illustration of which the familiar need of lime for the growth of the bones was mentioned. The figures, arranged in the table, according to the ratio of lime contained, indicate how unlike is the distribution of mineral ingredients in different common foods."

TABLE II

ANALYSES OF MINERAL INGREDIENTS OF VARIOUS ARTICLES OF DIET

(Arranged according to the ratio of lime contained)

	Potassium (K_2O)	Sodium (Na_2O)	Lime (CaO)	Magnesium (MgO)	Iron (Fe_2O_3)	Phosphorus (P_2O_5)	Chlorine (Cl)
Beef........	1.66	0.32	0.029	0.152	0.02	1.83	0.28
Wheat......	.62	.06	.065	.24	.026	.94	(?)
Potato......	2.28	.11	.1	.19	.042	.64	.13
Egg albumin	1.44	1.45	.13	.13	.026	.2	1.32
Peas.......	1.13	.03	.137	.22	.024	.99	(?)
Human milk	.58	.17	.243	.05	.003	.35	.32
Yolk of egg	.27	.17	.38	.06	.04	1.9	.35
Cow's milk.	1.67	1.05	1.51	.2	.003	1.86	1.6

Notice that a child would probably not obtain the lime requisite for the growth of its frame if brought up upon meat and wheat bread alone. Professor Bunge has lately called attention to the possible danger to children in the increased consumption of candy prepared, as it is, from pure sugar. He explains the popular notion regarding a connection between defective teeth and candy eating on the assumption that children who live largely on meat, bread and candy—all poor in lime—may fail to get their proper quota of this element. He urges a return to lime-containing sweet fruits for the dietary of children. This seems to me more rational, at least, than the indiscriminate administration of limewater. The quantities of lime in common foods are given in the table following:

Quantities of Lime in Foods

(Milligrams per 100 grams of the dry substance)

Sugar	0.0	Egg white	130.0
Honey	6.7	Peas	137.0
Beef	29.0	Plums	166.0
Wheat bread	46.0	Human milk	243.0
Grapes (Malaga)	60.0	Egg yolk	380.0
Graham bread	77.0	Figs	400.0
Pears	95.0	Strawberries	483.0
Potatoes	100.0	Cow's milk	1,510.0
Dates	108.0		

Whole wheat bread

The amounts of lime given in the above table, 46 milligrams for white bread and 77 milligrams for graham, are for each 100 grams of dry substance. Our own dietary, given on page 200, has about 65 per cent of this amount of bread. This bread would, therefore, contain about 30 milligrams of lime if it were white and about 50 if it were graham. The substitution of graham bread for white in the dietary would increase the lime by only 20 milligrams. According to "American Food Materials," the total mineral matter in white bread is 1.1 per cent, that in graham is 1.5 per cent. The substitution of graham bread for white, therefore, in the dietary would raise the total mineral matter 0.4 of a gram, or 400 milligrams. This would bring the mineral matter in the bread up to 1.5 grams and raise the total in the dietary to 10.1 grams.

So far as the total amount of mineral matter is concerned, this increase could have been secured by two ounces, or about one-fifth of a cup, of milk. So far as the increase in lime alone is concerned, the addition of a tablespoonful of milk would be as effective as the substitution of graham bread for white bread in the dietary. There seems then to be no reason to urge graham or whole wheat bread, either on the score of the total amount of mineral matter or on the score of the amount of lime. On the other hand, in the present state of our knowledge we are not prepared to say that this bread may not have advantages over white bread. It certainly has if the child prefers the taste of it or if variety is an object. What is said here refers only to mineral matter, not to the advantage which coarse bread has over fine bread in containing large amounts of cellulose and in giving needed bulk to the food. Even this advantage is sometimes overestimated when fruits and vegetables are available for the same purpose.

Eating between meals

The time when the child begins to take three regular meals a day like his elders is the time when the question of eating between meals arises. It may be said that at the beginning of this period the child should be given a certain amount of nourishing food in the middle of the morning and the middle of the afternoon; later, he should not be given food at these times, but should be permitted to take it, if it is of the right kind. At no time should the food between meals be of a character to tempt the child to eat unless he is really hungry. A cup of milk and some zwieback alone should suffice for an older child.

This matter of eating between meals is one in which very much could be accomplished by co-operation among mothers. One mother who allows her child to buy candy to eat between meals may make it exceedingly difficult for other mothers to adhere to their rules. One child treats another, and himself must in turn be treated.

We talk very much and perhaps fancifully of the "large homemaking" and "municipal housekeeping." There is danger perhaps of using the terms without grasping their real significance and importance. There are certainly, however, many problems which vitally affect the welfare of children, which cannot be settled by individual women in their separate homes. They call for the co-operation of all women of a community. The women of a town could, if they got together, control just as absolutely the food that is sold to the children of the town as they control that which is given to their own children within their own walls. It would probably be an unpleasant revelation to most women to follow the push carts from which school children are fed at recess and to trace to their source the candy and other foods which they carry.

It would seem as if the first duty of the "larger home-making" was in connection with the feeding of children. As a result of her experience on the Board of Education in Chicago, Miss Addams advises the Woman's Club of that city to make this work their chief interest for the near future.

The character of the various meals

With a general idea of the amount of food required daily there need be no effort to balance each meal. In general the simplest foods should be given at night. Bread, milk, and simple sweets like stewed fruits or plain cake, make a good supper for little children. The most important parts of the breakfast are milk, cereal or toast, and fruit. The question arises with school children whether the heavy meal ought to be at noon or night. At noon the meal may interfere with the afternoon work, at night with sleep. It should be remembered that the heavy meal usually means the one which includes meat. The nourishment obtained by the grown person from meat is secured by the child from milk. This may be so distributed through the different meals that there need be no especially large meal. The lunch taken by older people with the addition of milk can be considered the dinner of the child. His supper can then precede the regular dinner of the family and be very simple though nutritious. For school children a warm liquid is desirable at noon. This may be soup or cocoa. Chocolate is too rich. The fact that fats remain longer in the stomach than other substances makes it particularly undesirable to serve fatty foods at noon if the child is to return soon to work.

The lunch box

The use of paper napkins and paraffin paper has revolutionized the possibilities of daintiness and attractiveness in the school lunch. Napkins are likely to become soiled the first day, and if they are linen they must either be replaced, which adds materially to the family wash, or must remain in unattractive form. Paper napkins, if uncolored, are safe to use and need not be unbeautiful. Paraffin paper makes it possible to keep one food from adhering to another and to keep sandwiches, cake, and similar foods moist. Plain white paper napkins may be bought for 35 cents a hundred. Paraffin paper is sold at the rate of 24 large sheets for 5 cents.

When there is a chance to wash dishes in the school, it is not impracticable for each pupil to have his own knife, fork, spoon, plate, and cup. Enamel ware plates and cups are suitable for this purpose because light. Lunch boxes modeled after the expensive tea baskets used by automobilists can be made at little expense out of small wicker telescope bags.

Supports for the utensils can be made by fastening narrow leather straps to the sides of the basket. The telescope is mentioned because the price is low, but a basket with a hinged cover is more convenient.

The contents of the lunch box

In preparing a lunch-box lunch the same scheme may be followed as in the planning of the entire diet. As the mother looks ahead from day to day she can plan to have on hand always, besides the bread and butter, a protein-rich food, a fruit or vegetable, and a sweet. If milk or stew is provided at the school this supplies the protein-rich food and also the needed liquid. Let us suppose a potato soup is served at the school. If made with undiluted milk and served in sufficient quantity, it may be considered as satisfying the protein requirement. A lettuce sandwich and a fig, date, or prune sandwich, an apple, and a piece of cake, or rather that article dear to the heart of childhood, a small frosted cake, would make a dainty and reasonably well balanced meal.

A cup of cottage cheese, a slice of potted meat, meat or fish sandwiches, the yolks of eggs seasoned and spread between slices of bread and butter, or a cup of custard, are possible ways of serving protein-rich foods.

Raw figs, dates or prunes, baked apples, apple sauce, stewed dried fruits, or fresh fruits satisfy the demand for cellulose-rich foods.

The sweets may be in the form of plain cake, cookies, sweet sandwiches, sweet chocolate, or pure candy.

We would remind those who think that this meal is oversweet that it is better to have it oversweet than overfat. Sugar is rapidly absorbed while fat is the last substance to leave the stomach. Butter and mayonnaise dressing are the best forms in which to put fat into the lunch-box lunch. The latter, however, is an expensive food, and the butter is as digestible and wholesome. It is not so important to try to introduce wholesome fats into this meal as to exclude unwholesome ones. Fried foods should never be a part of the school lunch.*

Table habits

On the subject of table habits probably nothing better has been said than the following from Doctor Mendel and Doctor Oppenheim:

"We frequently hear the remark that childhood is the period at which correct habits should be formed. The subject is one which perhaps more properly belongs to the psychology of youth; but the foundation of proper habits of rest, exercise, and diet should be based upon sound physiological grounds. Life is in a sense a rhythm of inherited or acquired habits. With respect to one of these I can not refrain from quoting Dr. Nathan Oppenheim. He says:

"'From the earliest possible time the habit of eating slowly must be insisted upon. If this is begun at an early enough age, it is very easily learned and will prove to be a valuable acquisition for later years. If the child eats with an attendant or with the rest of the family, he should be allowed to talk to a reasonable extent; speech should be regulated, not forbidden. For with children, as well as adults, the act of speaking causes useful breaks in the steady course of masticating and swallowing food; it allows the gastric contents to be well mixed with the secretions of the stomach, and at the same time it provides an atmosphere of reasonable enjoyment that a child may claim as well as his elders. The rule that children should be seen and not heard is capable of too strict an interpretation that lends itself very readily to petty domestic tyranny. So long as there is a reasonable and healthy discipline in the household, every child should be allowed to talk, to take part in the family life, to feel that he is an integral part of the home circle, and to realize that his words—even if they be not heavy with wisdom—will receive the consideration and attention which abiding love and a mild toleration dictate. The ordinary child whose environment provides suitable examples of self-restraint and good manners learns in a surprisingly short time how to conduct himself within sufficient bounds to be reckoned as a human being, and not as a more or less untamed animal.' "*

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*Mrs. Frederic Schoff, president National Congress of Mothers.

I have dwelt upon the subject of table habits because physiologists are just beginning to understand the real significance of the pleasure of the table in the functions of digestion as well as in the broader enjoyment of life. The psychical element in digestion can not be overrated. Fear, sorrow, anguish, nausea, may promptly check the flow of the digestive juices, while palate-tempting dishes and the pleasure of the meal, with a congenial environment, are mighty incentives to the production of active digestive secretions. A scolding mother and a sensitive child make an unhealthy dining-room combination.

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*"The Care of the Child in Health."

XX

THE CHILD AND HIS SWEETMEAT PENNY

ELLEN FOSTER STONE

Press Chairman for the Pennsylvania Congress of Mothers

WISE indeed is that subdividing of the human race into families. In each household a head. Through these heads we reach the groups, through the groups the whole. It is in reaching the whole that we achieve betterments.

Matters great and small claim the attention of these race supervisors. Among the many deserving careful attention is the child and his money, sometimes given scant study because of its seeming lesser importance to the young life. Yet the child buyer is an important factor in the business world. One-third of our population is child population. The children's pennies and nobler coin are keenly counted upon by those who figure profits. And we should be equally keen in considering the child spender. The child and his money. What it may do. What it does do. How it does it and why?

Better watch the purchase

How often do we know what, where and how much the children buy? Far better is double supervision and service to a well child than watching by an ill one. *Better watch the purchases.* Frequently it will be found the thing bought hinders digestion, "takes the appetite," because the chief purchases made by children are sweetmeats. The child having small conception of quality or quantity, is governed rather by sight and taste. If the thing looks and tastes well, he will buy and buy if he has the price, will eat and eat if treated by a chum.

The sweet tooth necessary

His "sweet-tooth" is as much a necessary part of the child's make-up as are his hair and ears and toes. That craving for sweets is adjunct to growth. Satisfied, it gives heat and energy. Cheated, best development is thwarted. It should be wisely gratified. But the *penny should never be given to fill a pantry lack.* Much of the necessary sweet should be included in the day's foods, and the sweetmeats proper given preferably at the close of a meal, though this well known rule for health scarce needs repeating here.

It is right that children be given an *"allowance"* to teach them the care and use of money. It is for their elders to advise in regulating expenditure that it shall not undo the care exercised in the home. Then, too, the very infants now have an earning capacity. So soon as they can toddle on errands, "a good lady" gives them pennies, a "kind man" gives them candies. And right here we should do well to resolve to put an end to giving money and sweetmeats to other people's children and have other people stop giving the same to our own.

The bigness of the penny question

The child's use of money is a matter bigger than we realize. It can make him prey to designing companions, it can develop the spendthrift habit, and the evil of adulteration threatens. Too often, when left to their own selection, the children in "asking for bread are given a stone." For a brood of deceptions is found in the manufacture, distribution and display of those lesser wares—the cheaply priced dainties sold to children. Far too many have taken the short cut to easy money-getting by plundering children of their health through their pennies.

Again many dealers, real child-lovers, unwittingly sell spurious stuffs to children. We are familiar with the shops that cluster near most schools. We remember the countless soda founts, the ice cream stands and hokey-pokey carts, the street stalls with their varied array. We may cast casual glances at the beguiling goods enticingly displayed to attract children. Do we ever buy or try these wares? Do we watch children buy, catch the gleam of joyous expectancy as the purchased prize is grasped? It is cruel to deceive a child. But, deceit is not the only issue to combat. Danger, disease, even death may result. It is not imaginative sensationalism, nor mere opinion, it is fact gained by analysis of products purchased. It has been found that substitution and fraud pay better than honest goods. Inferiority hides in cheap disguises. Not good will but greed is the motive in manufacture, while the danger is to the consumer only.

Chemical ingredients used to last

Into the chubby hand of the radiant-faced child customer are given candies of great beauty, to please the eye and plague the stomach. For substitution runs riot in cheap candies, many of which, by use of chemical ingredients, are made *to last*. Stearin, an element employed to keep the candy hard in changing seasons and weathers, is wholly indigestible, as are the shellac and paraffine smuggled in to keep chocolates and other candies firm and glossy. Regular "armored" candy, we might call it, falsely flavored, colored, and sweetened with saccharine—that champion cheat—five hundred times as sweet as sugar, much cheaper, with none of its nutritive value. Though recently banned, legally, it is still used.

The fanciness of cakes

Cakes and buns are frequently *rich* in *color only*. Color instead of eggs and butter. Yellow, of course. If not used to defraud then why not green or red or copper color, each of which are among the seven legalized "harmless" colors for use in food manufacture. And who would believe that frostings and meringues could be made of soap-bark suds, sweetened and thickened? An egg saving, decorative device.

The four hundred per cent soda profit

And "sodas," the four-hundred per cent profit business, help to start the spendthrift habit and the acceptance of false values, even if no physical danger attached. In the cheaper kinds, this "cup of cold water" becomes a very witch's brew, carrying with it, for a penny or more, two kinds of poison in its color and flavor. If sweet and cold, the children are satisfied, coming again when they have the money.

The stomach-defrauding ices

In many of the cheap-vended ices and frequently in the better goods, there is deficiency in fats, the standard varying from four to fourteen per cent. Skim-milk, milk powder, glues, starches and gums are used as substitutes, thickeners and fillers, while chemical colors and flavors are added. The aniline dyes and ethereal flavors simulate natural fruit, satisfy the eye, cheat the palate and nurse, while defrauding, the stomach. The chill is about the only natural part in the assembled materials, and physicians tell us that the chilled stomach is not the healthy one. Nor can the dyed defrauded one be more so. And surely the stomach is defrauded when one has eaten stuff made from the formulae contained in the widely circulated pamphlet which benevolently told how to save labor, save ice, double quantity, increase profit and keep twice as long a product to cost only ten cents a gallon. Every element except the human consumer considered. The recipes sold at a big price are now suppressed, but the freed formulae still tempt to use. All the foregoing fraud things are so cheap as to be within the reach of every one. Far better were their prices beyond the reach of all.

Connecting the illness with the candy

Because immediate fatality does not follow unfortunate purchase, the cause of an illness is often overlooked. Or a child may be pale, listless, inattentive, never becoming vigorous, nor yet becoming really ill. And if ill, we seldom connect the penny and the pain. The thirteen-year-old daughter of a careful mother and wise physician father counted "thirty-two mosquito bites." None of the pests were in the house. Her father, on making a test, declared the "bites" "hives," and sought their cause in her food. None was found since great care was taken for proper feeding. The third night the young miss was seen eating supposedly cholocate chips of generous size, paper wrapped. Her aunt asked the price. "A penny apiece." "Does your father know you eat these?" "No, but only a penny's worth now and then can't hurt."

A clear case of home's precautions being undone by penny poisoning. Blood disordering by saccharine and stearin, registered in "hives" or skin eruption, causing much discomfort and calling for a blood-cleansing medicine.

Mothers must be inspectors-general

The health chief in one of our greater cities declared, with mounting indignation, in contemplating such matters: "Certainly these things kill. Not so much directly as indirectly do they make data for our statistics department. They put children on their backs, and often in their graves, by first lowering vitality and making them receptive to ills that kill."

Another asserted: "Epidemics are frequently the outcome, for the effects are not confinable to one locality. The subtle, ceaseless agents of communication, the air currents and dried dust particles go alike to tenement and mansion. It's everybody's problem.

"Withhold the pennies, withhold the dimes, I should say. Legislation can relieve, education must cure. It is absolutely beyond the power of government to effectually suppress. These things are stopped in one place but to reappear in another. No government is rich enough to hire sufficient watches. The mothers must be the inspectors-general."

And so it would appear. Do not be afraid to hurt the dealer's feelings: question him, observe his methods. You do him a kindness to remind him of short-comings. As much of the danger lies in the interpretation of the law, as in the law itself. We would do well to revive the ancient custom and hang our *food laws* in the market place. It might move a corrective were they read by many.

Law's requirements as to labels

The law now requires if any adulteration or artificial coloring exist, its nature should be stated on the label or stamped upon each package or portion distributed. The consumer then uses the goods at his own risk. The whole thing is an emphatic burlesque. Never is a "bun" a "soda" an "ice cream" or candy portion labeled. Yet the distributor, to protect himself from prosecution, should comply with the law even if he care not to protect the consumer.

Each portion *should be* labeled and each would *have to be* if we *were vigilant.* Then eventually it would become easier, more comfortable, more convenient to sell real goods only, even to children.

To circumvent the law, to reassure the consumer we see it urged that the permitted colors, preservatives, substitutes are not injurious when used in *rea-*

sonable quantities. Here another crooked path. How is it to be known where too much has entered the system, when we risk taking the reasonable quantity in any one or all of the many things eaten or drunk.

Passed under the food and drugs act

"Passed under the foods and drugs act" is misleading. Supposedly a guarantee, it is in reality an empty phrase, carrying with it no protection, because it is not stated *what* is passed. Naturally we would think what is approved is pure, but goods so labeled are found still using the barred saccharine and *"sugarine,"* its twin.

It is bad enough to be made ill by too much of a good thing, but it is deplorable, dangerous and should rouse our righteous wrath and stir us to work for elimination when we know of the miserable mixtures, blood devitalizers with the worthy left out, the worthless put in, that are broadcast. "The highwayman calls for your money or your life," declared an inspector in an eastern city, "but these jugglers are worse, for they care not if they take both your money and your life."

How we can help

Surely these very methods must work their own destruction once we see. We should know our state and national food standards and laws. Give our influence to the gradual betterment being worked for. See that such regulations as we have are in force. Agitate for better enactments. Watch the goods. Teach the children. Explain to them; appeal to their reason.

Also we must arrange to satisfy the child's craving in the home. Shaved and cracked ice with homemade fruit and chocolate syrups. Fruit, nut and raisin sandwiches, ripe fruits in season are better, cheaper, cleaner. You set a standard of purity, give memory a happy picture, and the example lives.

"The best investment," says an able editor, "is time and money spent on the children. We fill their wants at home so they need cast no longing eyes at the artistically adulterated fancy works displayed as tempters."

Above all, bring the children up to spurn evil practice, refuse the spurious, keep to fair dealing, so that in adult years there will be no secret practice, open defiance of hidden peril working ill to his neighbor. We look to a better humanity, a bigger brotherhood. Our deliverance comes not from the east or the west, but from the homes.

Parents have the dual duty. Home is the child's safety gate to the outer world and parents, especially mothers, are the safeguards of home. If there are no children of your own flesh and blood, then all children are yours to protect in matters such as these. You can aid the overwrought mother, you can aid the motherless child by compelling decent standards.

Pass such things must. And how? Only when enough of us are active to that end. Vigilance in overcoming must be widespread as is the practice. We, as customers, hold the controlling hand. Dealers will cease to offer what we refuse to buy. Thus the embers turn to ashes in this fire of falsity.

XXI

HOW TO CARE FOR CHILDREN'S FIRST TEETH

YOU would not be deliberately cruel to your children, would you? From every mother comes an indignant and emphatic denial of such a thought; yet, neglect of your children's first teeth is downright cruelty to each individual child.

Uses of the first teeth

Some mothers think that children's first teeth require no care at all, and that, even if they decay, it is unnecessary to bother about them. This is a great mistake. The first set of teeth, like lovely white pearls between rosebud lips, are needed to keep places for the second or permanent teeth. If these teeth be lost through neglect, the jaw will not grow to its proper shape, and when the second teeth appear they will be so crowded that they may be forced to turn sideways and grow very unevenly.

Danger in decayed first tooth

When a decayed first tooth is neglected and left in the jaw the decay is almost sure to eat downward to the root, and thus affect the enamel of the permanent tooth just forming underneath. Decay is poison which will cause, besides very painful toothache, all sorts of more serious complications. Remember that there are certain degrees of poisoning. A full dose of strong poison kills in a short time; a tiny dose of slow poison, often repeated, will gradually undermine the health, causing indigestion, headache, loss of sleep and general malaise. Every symptom may come from a decayed tooth left in the head, where the child is constantly swallowing tiny particles of poison. Perhaps such a thought has never occurred to any of you, yet it is a fact. No mother would give her child poison, yet she will go complacently about her household duties while little Dottie or little Tom is suffering with toothache and absorbing the poison from that decayed tooth.

Another great source of harm to young children which is caused directly by decayed teeth is the habit of bolting their food. By this I mean swallowing whole mouthfuls of food without properly chewing it, so that it will be easily digested when reaching the stomach. Children with bad teeth dread to bite on them lest they start aching, therefore they swallow their food without proper mastication. This leads to malnutrition and all sorts of stomach troubles—troubles that seldom end with childhood, but continue to torment the child after he has grown to manhood and even to old age.

Use the dentist

I wish I could impress upon every mother the importance of taking the children to a competent dentist at least every six months. Then if there is trouble it can be attended to before it has reached the harmful stage.

Because a first tooth shows decay and aches, do not have it pulled. Let the dentist fill it so that it will last until the natural time for it to come out; or at least get advice of your dentist regarding the disposition of a bad tooth. Take your children regularly to the dentist. You will find the money it costs well spent; for if a child's first teeth are well cared for he will have little cause to have much done to his second teeth, which, unless he is a very delicate, sickly child, will be strong, white and healthy.

Above all, teach your children when they are very young to brush their teeth twice a day, and insist upon their keeping their teeth clean.—[*From the "Philadelphia North American," by permission.*]

XXII

THE CARE OF BABY'S NOSE AND THROAT*

MARIANNA WHEELER

Ease with which trouble may be avoided

THERE is no doubt that much of the nose, throat, and ear trouble, with the consequent sore throat, coughs, and discharging ears, which are so prevalent among children, might really be avoided if a little more careful attention were paid to them. These individual organs are so closely connected with each other that if one is affected one or both of the others is almost sure to suffer also.

Breathing through the nose

The means of entrance, by which air reaches the lungs, is through the nose and mouth, or both. The larynx, trachea, and bronchial tubes are the connecting pipes between the two. As an opening for the air to enter, the nose is far better than the mouth for many reasons, one of which is that the mucous membrane of the nose is much tougher and less sensitive than that of the mouth and does not dry so easily when coming in contact with the air. Again, the nostrils are lined with fine hairs which act as a filter to catch dust and foreign matter which the air contains, thus preventing much that is irritating from entering the lungs. The air breathed into the lungs through the nose, in passing through the nostrils, especially in cold weather, loses some of its chill, thus entering the lungs warmer than that which is taken in through the mouth.

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*From Harper's Bazar; copyrighted, 1912, by Harper Brothers.

Evils of mouth breathing

When air is drawn through the mouth the mucous membrane of mouth and throat becomes unnaturally dry. Dust and germs of the air are allowed free entrance, and coming in contact with the delicate throat, cause irritation and soreness. From this irritation the throat becomes swollen, the tonsils enlarged, and a growth soft and spongy appears at the base of the nostrils, stopping them up.

Consequently the nose, as a means of carrying fresh air to the lungs, is put out of commission and the result is catarrh, colds, and almost constant irritation of larynx and bronchial tubes.

The nose and ear are in close connection by means of a tube and the mucous that is constantly forming and finding insufficient outlet, naturally forces its way through this tube leading to the middle ear. Finding no escape an abscess forms, causing intense pain until the ear drum becomes perforated by natural or artificial means. If the pus formed does not find escape through a perforated ear drum, it is apt to burrow still farther, and what is called a mastoid abscess forms, which is most painful and not without danger of serious consequences.

Begin prevention early

The preventive treatment of these ills cannot commence too early in childhood. From the time the baby is born watch its breathing closely, especially when asleep, and if you find the lower jaw dropped, with mouth open, gently close it. At first it may be necessary to do this many times, day and night, until the child naturally falls into the habit of keeping his mouth closed. Watchfulness will pay both you and the child in the end.

One thing should be remembered, and that is to keep the nostrils perfectly clean and free from obstruction. Otherwise when the mouth is closed all means of breathing and carrying a fresh supply of air to the lungs is completely cut off. Therefore it is most essential that absolute cleanliness of the nose should be observed if the child is to breathe through that organ. Its toilet should be attended to before putting the child to bed at night and on arising in the morning, also during the day if necessary, in both infant and older child.

The best method of accomplishing this is by means of a swab made with a small wooden toothpick wound at the end with absorbent cotton. The swab, in order to enter the nose of an infant, must be very small and soft. A bit of absorbent cotton about the size of a dime in circumference and almost as thin as a cobweb, will answer the purpose. In winding it on be sure that the end of the toothpick is well covered so as to prevent injury. Go into the nose very gently and remove any accumulation of mucus there may be. Sometimes when the secretions become hard, and are tenacious, as in the case of cold in the head, the swab must be slightly lubricated with white vaseline, sweet oil, or alboline in order to soften the secretions and make the removal less difficult. Secretion of mucus should not be allowed to accumulate in the nose or run back down the throat and be swallowed by the child; if so, catarrh of nose, throat, and stomach is likely to result.

Individual handkerchiefs

As soon as a child is old enough he should be taught to use a handkerchief and properly expel mucus from the nose. The handkerchief should be an individual affair and the use of a common family one cannot be too strongly condemned. Most colds, especially those of the influenza type, are now pronounced infectious by physicians. Diphtheria germs are also as common in the nose as in the throat, if not more so, and surely there is no surer way of distributing these germs, so common to both nose and throat, than by the indiscriminate use of the handkerchief.

The youngest baby should have a handkerchief laid aside for his special use, and the use of mother's, father's, nurse's, or anyone's else, should be strictly prohibited. Each older child in the family should be provided with his individual handkerchief, with a suitable pocket to keep it in, and taught its proper use.

When there is a severe cold in the head accompanied by a profuse nasal discharge, as soon as the handkerchief becomes damp from constant use it should be exchanged for a fresh one. The discarded ones should be soaked in a mild disinfectant and boiled before going to the laundry.

If a child develops a persistent nasal discharge without the other usual signs of a cold in the head it is well to have the nose examined for some foreign body, such as a pea, bean, button, small stone, or other foreign substance. The child may have poked it into the nostril where it has become firmly lodged. The irritation produced by its being there causes the discharge.

Consult a physician

If there be a constant thick purulent discharge, especially if it is streaked with blood or a bloody discharge, it is best to run no risk but consult a physician. Have a culture taken from the nose and examined for diphtheria bacilli. In the meantime, as a matter of precaution, keep the child isolated from others and carefully disinfect all handkerchiefs used.

When an acute coryza, or cold in the head, is present, the congestion, inflammation, and thickening of the mucous membrane of the nose is such that it is often very difficult, if not at times impossible, to breathe through one or both nostrils. It is a common practice, as well as a most deplorable one, at such times, to syringe the nose with some fluid or have the child snuff it up into the nostrils. Almost every specialist of nose, throat, and ear will tell you that a large share of ear trouble can be traced to this practice.

If necessary to relieve this unpleasant stoppage, try swabbing the nose with a little warm vaseline, goose grease, sweet oil, or liquid alboline, which latter is rendered more effective by the addition of one grain of methol to an ounce.

XXIII

BAD EYE CONDITIONS

NO words need be wasted to convince anybody what a calamity blindness is; but there is a long list of misfortunes and handicaps which may be the result of eye strain due to defective conditions: severe headaches frequently recurring and extending over many years; epilepsy, chorea, neuralgia, dizziness and various other nervous troubles; mental backwardness of children; lateral curvature of the spine, due to faulty positions which improper lighting or defective eyes cause pupils to assume, etc.

Effect of school work upon the eyes

School work, under unfavorable conditions, has a strong tendency to bring on diseased conditions of the eyes. The unfavorable conditions may be due to faults of the eyes which should be corrected by glasses, or to wrong methods of lighting school rooms. Referring to one disease of the eye only, it is found that the percentage of pupils troubled with myopia increases with the number of years in school; and the grade of the myopia also increases with the grade of the school. That is, it increases from class to class. For instance, in France there was very little myopia in the lowest classes, 17 per cent in the intermediate, and 46 per cent in the most advanced classes. In some of the colleges it was much worse. The same serious condition has been found in the schools in other European countries and in this country.

It is found also that defective conditions of the eyes come on more rapidly in school rooms which are improperly lighted.

Right and wrong school room conditions

In the school room the eye is the organ which is the most severely taxed. The eye should therefore have the best possible conditions arranged for its work.

The principal light in the school room should come from the pupils' left. The very best lighting is when the light all comes from the left, provided the school house can be so placed that the light comes from desirable points of the compass. The next best is with the principal light from the left with the smaller glass area at the rear.

Light from the right of the pupil is bad for the reason that the pupil's hand, in writing, throws a shadow upon his work. Light from right and left gives troublesome crosslights which are trying to the eyes. Light in front of the pupils is absolutely bad and should never be tolerated. The windows at the left which supply the principal light should be massed with the narrowest possible spaces between them.

Direct sunshine should not fall upon or near the pupils' desks, nor come into the school room during school hours. The best light comes from the east, northeast, north, or northwest. Light from the southern windows should be moderated carefully by curtains during school hours when the sun is shining.

To ensure sufficient light, the glass surface of the windows should equal one-fifth, and still better one-fourth, that of the floor surface. (Figure it out for your own school room.)

Blackboards between windows or near them are bad for the eyes. Eyes are strained when the student is forced into improper attitudes by desks and seats not properly fitted to him.

Various suggestions

If the eyes of an infant, four weeks old or less, become inflamed, report the case at once to a physician. In many states there is a stiff penalty for not doing so, and well there may be, for one-third of all cases of blindness are caused by the want of prompt action in these infantile cases.

A person with inflamed eyes should have wash bowls and towels of his own, and otherwise should be extremely careful not to let other persons catch his trouble. Many inflammations of the eyes, particularly purulent inflammations, are very contagious. Never poultice an eye. There is extreme danger in doing so.

Pain in or over the eye is a danger signal which should receive prompt attention. In persons past middle life, pain and perhaps dimness of vision, may mean a disease which sometimes destroys the sight very quickly, and always pretty surely if not relieved.

Gradual dimness of vision, usually without pain, may presage Bright's disease, cataract, or other serious local or general disease.—[*An extract from leaflet of the Maine State Board of Health.*]

XXIV

DISEASES, DEFECTS, AND CARE OF CHILDREN'S EYES

JOHN T. HAMILTON, M. D.

INFANCY and childhood are in certain respects the most important and interesting periods of life. To the physiologist they are interesting because they are the periods of development, and greatest functional activity; to the pathologist because in these periods many diseases occur which rarely ever occur in later life; to the physician and the parents they are especially interesting because in these periods there is the greatest amount of sickness and largest number of deaths. Infancy extends from birth to the completion of the first dentition, or about two and a half years. Childhood extends from infancy to the age of about fifteen years of puberty, and is a period of rapid growth and great physical activity. In infancy the senses are not perfectly developed. This is very noticeable from the fact that the eyes of infants are rarely attracted by bright objects, such as a lighted lamp.

Asymmetry Asymmetry of the eyes may be detected by looking at the face of the child through a wire screen at right angles to the face. The right eye is more often found to be the higher of the two, and the left eye is usually nearer the middle line of the face. Why this is the case we do not yet understand. One eye is frequently wider open than the other. One important factor is generally overlooked—namely, that there is not only a difference in the height between the eyes, but that one orbit and cheek stand out more prominently than the others. Again the child may have an uneven head and face which will make the eyes appear unsymmetrical. The eyelid of the infant differs, in some respects, from that of the adult, yet the thickness of the edge of the lid is nearly as great at birth as in the adult. The most striking differences are the relatively small size of the muscles in the lid of the infant, and the collection of fat, which accounts in a great measure for the thickness. In the infant the glands of the eye are very large, which may account for the baby's secreting and excreting so many tears. The eyelids vary their relation to the eyeball according as they are opened or closed. When open they form a considerable aperture or fissure. In children the length of this fissure is greater than in adult life, and this fact, in conjunction with the greater elasticity of the lids, is the cause of their widely opened or "staring" eyes. There is a decrease in the length of this fissure as we grow older; especially is this noticeable in old age.

Diseases of the edges of the eyelids

Affections of the edges of the eyelids of children are among the most frequent of all diseases. The free border of the lids are distinguished by many anatomical peculiarities, such as the eye lashes, with their hair follicles, and their little glands deep down in the lid. These are very susceptible to disease. Inflammation of the delicate structures may be caused from prolonged weeping, straining of the eyes, vitiated air, wakeful nights, uncleanliness, smoke, dust, heat, extreme cold, and many other causes of which some mothers are not aware. I desire to call attention more particularly to the disease known as blepharitis, which is an inflammation of the lids involving the eye lashes, hair follicles, and the small glands at the roots of the eye lashes. In this disease the skin between the lashes is covered with small, white or gray scales, resembling dandruff. In other cases the borders of the lids are covered with yellow crusts, and when they are washed off the edge of the lid appears red and inflamed. In severe cases small ulcerations appear, together with abscesses which originate from suppuration of the hair follicles. If the disease is allowed to continue, the latter condition is the most serious, for the nourishment is taken away from the very roots of the eye lashes, the hair follicles become destroyed and permanent loss of the eye lashes takes place. This disease may also result from some constitutional, or hereditary disease, among which may be mentioned scrofula and tuberculosis. Anaemia and a want of proper nourishment is given by some authors as a predisposing cause. The eruptive diseases, such as scarlet fever, measles, smallpox, also eczema and erysipelas, sometimes leave the eyelids in a condition favorable for the development of blepharitis. Mothers can, to a certain extent, prevent the onset of this disease by close observation of their children's eyes. At the first appearance of the scales among the eye lashes, they should be bathed away with a salt water solution. Should this fail to effect a cure in a reasonable time the child should be placed under the care of a physician, before the disease has reached the stage of suppuration involving the hair follicles.

Styes

A stye is a small boil situated in the edge of the eyelid, often coming to a point around one of the lashes. It begins with a small red pimple, swells painfully and goes on to suppuration in from three to six days. The swollen condition rapidly disappears when the stye opens itself or has been lanced. As soon as a pus point is observed it should be opened and the pus relieved. When the stye first appears, and before any pus has been formed in it, dry heat, such as dry hot cloths kept continually over the eye will lessen the pain, and sometimes abort the disease, but on the other hand, if pus has begun to form, frequent bathing the eye with hot water will aid in bringing the stye to a hasty formation, ready for the lance. Should a frequent recurrence of styes continue the child's eyes should be examined by an oculist to ascertain and remove the cause. If due to eye strain, glasses should be prescribed.

Slight inflammation in the eyes of children, resulting from cold winds, hot weather, and the like exposures, may be relieved by keeping the child indoors for a few days, and bathing the eyes frequently with a hot solution of boric acid, one level teaspoonful of boric acid powder dissolved in a pint of hot water. Be sure that the water is hot, for boric acid will not dissolve freely in cold water, and hot water is the better for these inflammations. Even the old household remedy of bathing the eye with a weak solution of common table salt and hot water, one-half a teaspoonful to the pint, is not a bad remedy. I do not desire to encourage you in attempting to treat your children's eyes yourselves, but these remedies are harmless, as well as beneficial, in simple cases.

Foreign bodies

Injuries to the eyes by foreign bodies are of common occurrence. The injury may be only a bruise or contusion, or it may be an abrasion with loss of substance, or it may be a penetrating or punctured injury, the latter being very serious in nature.

When the foreign body is metal, glass, or other hard substance, and strikes the eye with great force, it often penetrates the interior of the eyeball. Eyes thus injured are generally lost, and, if one eye is injured in this manner, and is not removed, it often causes sympathetic inflammation of the other eye. It is, therefore, of the utmost importance that early surgical treatment of the injured eye be resorted to in order to preserve the sight of the sound eye. Again serious injury may result from very small particles of foreign bodies floating in the wind, such as a cinder or a tiny grain of sand, finding a lodging place in the front of the eyeball. If it is a small object and becomes imbedded in the cornea, over the pupil or eyesight, it is sometimes difficult to locate without the aid of a powerful magnifying glass, hence it is frequently overlooked by the parents until ulceration has set in, and great pain and inflammation appear. These foreign bodies are very deceptive at times, and are easily overlooked. For instance, the little object may be in the center of the cornea, immediately in front of the dark part of the eye, and the child will refer to the upper lid as the source of the irritation. When the eyelids are closed the upper lid comes in contact with the foreign substance in the front of the eye, thereby scratching the lid, and the sensation thus produced actually deceives the child, as well as the parent, into believing that the offending substance is imbedded in the upper lid instead of being in the eyeball.

Pink eye

Acute contagious conjunctivitis, commonly called "pink eye," is due to a germ, and is easily communicated from one child to another. The duration of the disease is from a few days to three weeks. The eye looks red, there is much pain, and the tears flow freely, but there is no thick mucus or pus discharge at this stage. The glare of a strong light is annoying to the child, and the use of the eyes for only a short while is uncomfortable. Once a child has contracted this disease it should be isolated from other children, and the eyes kept in a clean antiseptic condition, care being taken that other children do not use the same towels and toilet articles used by the afflicted child.

Diseases which affect the sight

Many diseases cause weak eyes and blindness. The eruptive diseases, such as measles, scarlet fever, and smallpox, may result disastrously, especially in children favoring the evolution of scrofulous diathesis. Among the constitutional diseases of parents which predispose their children to disease of the eye are tuberculosis, scrofula, and syphilis. Eye diseases of children, due to hereditary scrofula, are very common. The scrofulous child should, from birth, be placed under the very best hygienic care, and special attention given to its nutrition. Tuberculosis of the eye usually occurs in children and young people, and generally affects but one eye, although it may affect both. As in scrofula, the child should have good nutritious food, the proper hygienic care, and plenty of fresh air as it grows older. Hereditary syphilis of the eye may manifest itself from birth, but it most often occurs between the ages of three and eleven years, and in some cases it develops even later in life. All the tissues of the eye may, at times, manifest the signs of this dreaded disease. Vision is frequently much impaired, even under the very best persistent medical treatment it is slow to clear up, and often leaves the cornea, or front surface of the eye, more or less cloudy. The eyes of hereditary syphilitic children should be kept under the careful and frequent observation of a competent oculist during the entire period of childhood.

Granulated lids Granulated lids are a frequent cause of weak eyes and blindness. This disease is more prevalent in children attending school than among infants. It is very infectious, and especially occurs among children who are crowded together in ill-ventilated, badly lighted, damp rooms and workshops. Dust and other foreign substances aggravate this disease. Granulated lids among the school children is, to a certain extent, being overcome by improved sanitary conditions, for which boards of health, boards of education, and teachers deserve much credit. The disease is often communicated from one member of the family to another by the use of sponges, napkins, towels, handkerchiefs, as well as wash basins. Do not delay the early treatment of granulated lids, for it is easily cured in the first stage, but after it has become chronic its cure is long and tedious, and is attended by permanent consequences of a serious character.

Digestive causes In the majority of diseases of the eyes of children it is advisable to look after the digestive organs, and if there is any indigestion, constipation, stomach or bowel trouble, it should receive attention. The irritation caused by worms in the intestines will readily cause a partial dilatation of the pupil, which disappears when the intestinal worms are evacuated. There are a few instances of diseases of the eye said to be caused by affections of the teeth. I have been fortunate in having a dentist associated with me in my office for the last eight years, and the clinical material, in this line, presented in our practice has given each of us a splendid opportunity to study the effect of carious or diseased teeth upon the eyes of children, and I must say our experience has not only proven mutually beneficial to us, but it has shown beyond a doubt that a number of weak and diseased eyes are due to a reflex irritation from carious teeth.

The eye as an apparatus

Few of us ever realize the many quick changes which the mechanism of the eyeball undergoes, when we look from one object to another, or to a distance and then near by, or when we pass the eye rapidly over the pages of our books. The eyeball is much like an optical instrument. This can be more fully illustrated by looking through an opera or field glass at some object far away for a few seconds, and then without removing the glass from the eye quickly looking at an object nearer at hand. It will be impossible to see the near object without changing the focus of the instrument. This is on the same principle that the eye adjusts itself for different distances, doing the greater amount of work when looking at nearby objects, and less work when viewing objects at a distance, the lens in the eye becoming more or less convex according to the distance at which we see the objects. This leads us up to the study of those defective conditions of the eye that affect more school children than all others combined, and that is "errors of refraction." In order to be plainly understood, I will use the term "eye strain." I will also use the term "near sight" instead of myopia, and "far sight" instead of hyperopia. All eye strains are due to either near sight, far sight, or astigmatism.

Near sight

Near sightedness is that condition in which the eyeball is too long from before backward. The normal eyeball is one in which the rays of light will come to a perfect focus immediately on the back of the eye, the length of the eye being abnormally increased, the rays of light would focus before reaching the back of the eye, and a consequent blurring of the vision takes place. Thus a strain is put upon the muscles of accommodation while they make a desperate effort to focus the light further back.

Near sightedness is both hereditary and acquired. In the acquired form, found in many students, it is due to constant straining of the eye, produced by the habit of continuously leaning forward over the desk, with the eyes turned downward, which causes a pressure to be exerted upon the sides of the eyeball from the ocular muscles, thereby making the eyeball longer than normal. Owing to this fact it is important that the tables, desks and seats, should be so arranged that the child can sit as nearly erect as possible, with the eyes directed toward the book at such an angle that they will not be turned in a downward direction. The character and size of print is another thing that should be carefully looked after. Small, defective and blurred print should have no place in our school books. Young children should be allowed to rest their eyes occasionally from their books, and given plenty of outdoor exercises. An abundance of natural light upon the book, preferably from north windows, and from the side of the student, is advisable, but artificial light should certainly be discouraged. Near sighted children never have perfect distant vision, except through the aid of glasses. The near sighted eye, as a rule, is full, large and prominent, and is clearer, or rather not so much redness is to be seen in the white part of the eye as in other eyes. The principal treatment for near sightedness is the correction of the defect by proper glasses.

Far sight

Far sightedness is that condition of the eye in which the eyeball is too short from before backward, or its refraction is too low. The light does not come to a focus at all within the eye, but at a point beyond the back of the eye. As a general rule children that are far sighted have smaller eyes than those who are near sighted, the eyeball being smaller in all its dimensions. A child may have good distant vision and yet be far sighted, while on the other hand a near sighted child, as I have told you, never has good distant vision. The far sighted eye is not so clear as the near sighted eye, but is redder and often has the appearance of being inflamed. The pupil is smaller, and the child seeks stronger light by which to read. Frequently when writing or reading the letters seem to run together and are blurred. The child may blink its eyes, often squints them, and complains of a burning sensation or roughness of the eyelids, and styes may form. The child stops reading to rub its eyes, but the same troublesome symptoms soon reappear. The only remedy for far sightedness is to correct the defect by the proper selection of glasses.

Astigmatism

In astigmatism, one meridian of the front of the eye, or the lens, is more or less curved in one eye than in the other. The vision of a child with astigmatism of a high degree is always impaired to a certain extent, and the child frequently holds its head to one side in order to see better. Sometimes there is a twitching of the muscles of the face and the corners of the mouth and the eyelids. There is great nervousness and irritability. Astigmatism is often responsible for bad health and other serious affections of children. As in the other refractive troubles, we correct astigmatism with glasses. All three of these defective conditions of the eye will cause eyestrain, and will not only result in the symptoms mentioned peculiar to each, but any one of them may result in headache, pain in the temples, over the eyebrows, and deep in the eye. Even cross eyes sometimes result from eyestrain. All of these conditions can be relieved by the adjustment of proper glasses. The old way of prescribing glasses to simply improve the vision is not sufficient, but the new and correct way is always to relieve the eyestrain and consequent exhaustion of the nerve energies, regardless of whether or not the glasses improve the vision. The reason I cling to this modern theory is because it has been practically demonstrated beyond question that a child may have good vision, and yet have eyestrain, and much nerve force may be required for the eyes to perform their work. The eye is the most delicate piece of mechanism of any part of the body, and is guided and controlled by a fine system of muscles and nerves, that perform with marvelous rapidity the most accurate and delicate service. In school children this work is actively going on all the time they are at their books, thus requiring a greater supply of nerve force. Consequently if their eyes are defective in any way, or there is an eyestrain so as to affect the muscles of the eye, you can understand that it will require two or three times as much nerve force to enable the eyes to do their work.

Headache and eyestrain

Eyestrain is the most common cause of headache in school children. Many children do not suffer pain in the head until they begin school life, and their eyes are brought into more constant use for near work. We see this abundantly exemplified in young shop girls, typewriter girls, and young seamstresses, all under the strain of using their eyes for nearby work of long hours and exacting duties. Headache affecting the nerve in the eyebrow is a common result of eyestrain. Commencing over the eyes it spreads back and in nervous children may spread over the entire head. It grows worse from excessive use of the eyes, and sleep often fails to relieve it. Defective vision, which gives rise to blurred, indistinct images is always very disturbing and harmful to nervous children. The headaches in a few cases become so severe and persistent as to cause dizziness, nausea and vomiting, and may develop into chorea, a jerking of the hands or feet, hysteria, and in long continued cases mania may result. I have seen some of the severest forms of headache, due to eyestrain, affect the mental as well as the physical health of a child. I remember a little girl that was placed under my care a few years ago. At the age of six she entered school, and it was found that she would give her attention to her books but about ten minutes at a time. She began to tire and a perseverance in the attempt caused headache, pallor of the face, and a disposition to ignore surrounding objects of interest to other children. Her memory was not retentive. Her mother said she was restless at night and that she was getting irritable and petulant. Loss of sleep, loss of appetite, loss of flesh, and a general breakdown of the nervous system was apparent. After she had been kept in school for several weeks the teacher suggested to the parents that they take the child to an oculist and have her eyes tested. Upon examination I found her suffering with a high degree of far sightedness, together with astigmatism. Glasses to correct the defect were prescribed, and the child was placed in the school again, where, after a little while, she became one of the foremost in her class, a bright, studious, intelligent, healthy child.

Medicine not the remedy for eyestrain

Parents are sometimes unwilling to let their children wear glasses. Even intelligent mothers will bring their children to my office and say: "Doctor, my boy has strong eyes, he does not need glasses." "I want you to see what is the matter with my little girl's eyes, but you must not put glasses on her." Poor mother, she means well, but she does not and can not understand the relation of the eye to the nervous system, and she fails to appreciate the fact that the eyestrain overtaxes her child's nerve capacity, and brings about a physical unbalance, as well as the eye symptom for which she has brought the child to consult me. When all these pains and aches in children are the result of eyestrain, we may exhaust the materia medica in trying to find a remedy, but we shall never succeed in permanently alleviating the distressing symptoms until they have been relieved by the proper and scientific adjustment of glasses. Children's eyes should always be carefully examined before they enter school, by some competent physician who is thoroughly conversant with the refraction of the eye, and if he discovers an eyestrain let him correct it. These examinations should be made every year or two, in order to see whether or not there is any change in the degree of the eyestrain, and if so, the glasses should be changed accordingly.

XXV

HOW TO CARE FOR THE EARS

PEOPLE generally have but little idea of the unfortunate results and of the dangers which very often follow earache, inflammation of the ear, and "runnings" from the ear when neglected. That is why this leaflet is prepared.

Structure of the ear

That part of the ear which stands out from the side of the head and collects the sound waves is a useful part, but not the essential part of the organ of hearing.

The outer passage of the ear, about an inch inward, is closed by a membrane stretched tightly like a drumhead. It is, indeed, called the drumhead of the ear. The cavity beyond that is called the drum of the ear, or the "middle ear." It has no outward communication except with the upper cavity of the throat and nose through the Eustachian tube. Beyond the drum is the third cavity, called the "internal ear." The nerve of hearing is distributed within this.

Troubles of the outer ear

Insects may crawl into the ear. When they do so their fluttering or scratching against the drumhead of the ear causes such a noise and so unpleasant a sensation as wildly to excite the child. Warm water or sweet oil poured into the ear drowns the insect and floats it out.

Foreign bodies lodged in the ear are not nearly so dangerous as unskillful efforts at their removal, which often cause rupture of the drumhead or partial or complete destruction of hearing in that ear. Their removal is work for the physician.

Boils sometimes form in the skin which dips down into the outer ear passage. They are often very painful. They and other troubles of the external ear are sometimes caused by the use of the ear scoop, toothpicks, hairpins, or other things used in the outer passage of the ear. With such things the outer passage of the ear may be infected or the drumhead of the ear may easily be injured or even ruptured. Never use anything in your ear or scratch it with anything but your elbow, is the good advice which the old doctor gave.

Diseases of the middle ear (the drum of the ear)

Diseases of the midde ear usually result from unhealthy conditions of the throat or nose. Adenoids or enlarged tonsils may be the cause, or a chronic catarrhal process which may extend to the Eustachian tube. Closure of that tube removes the air pressure from the inner surface of the drumhead, while the pressure from the outside continuing, bulges the drumhead inward and hardness of hearing results.

Acute inflammations

But the main purpose of this leaflet is to tell about some acute troubles which endanger life as well as hearing.

The inflammation of the nose and throat, caused by a severe cold or by an attack of the grip, may extend upward through the Eustachian tube to the middle ear. When that occurs the inflammation of the lining of that tube often closes the passage through it so that the purulent, or other fluids forming in the middle ear, cannot escape into the throat. The pressure of these pent-up secretions often breaks through the drumhead and the fluids are discharged externally. These "risings in the head" or "abscesses in the head," as the trouble is sometimes called, should be regarded as a serious matter. The severe earache may cease as soon as the rupture and discharge takes place, but the danger continues. But it should be remembered that infants may have serious inflammations of the middle ear without indicating the fact by crying. Right back of the ear is a bony prominence, the "mastoid process." It contains cavities, or cells, which are connected with the middle ear; and the inflammation often extends from the middle cavity of the ear to those cells. And these cells are close to the base of the brain. The great danger to life is the extension of the inflammation to the brain or its membranes.

When the inflammation of the mastoid cells occurs, a serious surgical operation is often required to save life; but in the greater number, this operation is not done and life is lost by the extension of the inflammation to the coverings of the brain, or by abscess of the brain, or by disease caused by the extension of purulent or infectious matter to other parts. This happens so frequently because parents do not understand how great the danger is.

Greatest cause of these troubles

And just as long as a discharge from the ear goes on, this serious danger hangs over the child; and the discharge is more and more destroying the hearing.

A common cold may start this chain of disastrous results; but the great sources of it are the infectious diseases, particularly measles, scarlet fever, diphtheria and grip; though the infection, which lights up these dangerous ear troubles, may be that of whooping cough, mumps, pneumonia, erysipelas, tuberculosis, or smallpox.

During an attack of any of these diseases, particularly of any of the four first mentioned, great care should be taken to prevent the extension of the infection to the middle ear.

The infection may be blown directly in through the Eustachian tube by blowing the nose. Hence the urgent need of cautioning the patient to abstain from acts which may cause so much trouble.

The inflammation is not so likely to extend to the ear if the throat and nostrils, in infectious attacks, are kept clean with mildly antiseptic washes; but if applied with the nasal douche, there is extreme danger of the fluids penetrating to the cavity of the middle ear, thus carrying infection; and this danger is not wholly absent in using some of the hand sprayers. This treatment should be under the supervision of the attending physician.—[*From a leaflet of the Maine State Board of Health.*]

XXVI

INFECTIONS

The surest way to spread infection

WHILE we have, for ages, been impressed with the danger of the spread of disease through the air and by means of clothing, bedding, and rooms which have presumably been surcharged with infection, we have, of late, been emphasizing strongly another way in which the infection of certain diseases is spread with the utmost certainty—by direct infection, "contact infection," it is often called. For example, we may go into the room where there is a case of typhoid fever or of diphtheria, and by observing proper precautions, there will be but little danger of taking the disease or of carrying it to others; but in attending to the wants of the patient, our hands become contaminated by contact with him or his clothing or bedding or other things which have been soiled by him—then, if without washing or disinfecting our hands very thoroughly, we put our fingers to our lips or nose or handle food which is going to our mouths, there is serious danger of taking the disease. If we infect our hands by actual contact with infectious persons or things, or if we carelessly sit upon the infected bed of the sick person, the hands or clothing will be much more likely to carry infection than they would with the much slighter chance of having infection carried to them by the air.

Contact infection

What has already been said explains what is meant by contact infection. It only remains to emphasize the large part it has in spreading infectious diseases. In some hospitals, particularly in some of those in Paris, they have been caring for cases of typhoid fever, scarlet fever, diphtheria, measles and even smallpox, all right in the same room together. They have even been taking care of persons with diphtheria, scarlet fever, or other infectious diseases in the rooms of the general hospitals where persons are sick with troubles other than the infectious diseases. And this has been done with a remarkably few transmissions of infections to other patients. These infectious persons have been separated from the other patients by light partitions extending upward only a few feet from the floor or by screens or by partitions of wire netting, letting the air circulate freely through, or by only a tape extending around the few feet of floor space belonging to each infectious person—these enclosures only to remind the nurse, constantly, that she is dealing with infection and that she must always be exact in her obedience to certain rules. And what are those rules? Simply that she shall be scrupulously careful all the time to avoid the infection of her clothing by contact with infected things and that, before leaving the enclosed space, her hands must be washed and disinfected with solutions which are known to be trustworthy. Though we may not be ready to follow the French doctors in their methods, the results in those hospitals and in a few others outside of France, have certainly shown how much may be accomplished in preventing the spread of infection by strict precautions against contact infection.

The mouth, an open portal

Infection may be received into the system by breathing it in or by having it inoculated through the skin by cuts, punctures, or the bites of insects; but the mouth is the principal port of entry for those undesirable immigrants, the disease germs of many of our infectious diseases. We can mention only a few of those infections.

Typhoid fever

The large outbreaks of typhoid fever are almost always due to infected water and infected milk, but following the primary cases in the outbreaks, there is great danger of other cases in the same families coming down as the result of contact infection. One boy in a family of eleven came down sick with typhoid fever. Eight others in the family took the disease from him. In another family one of the boys brought home typhoid fever. The mother, a very untidy woman, with unwashed hands, went from her care of the sick boy to her preparation of the meals for the family. The other two boys came down with a very malignant form of the disease, due, undoubtedly, to the massive doses of infection the unwashed hands of the mother had conveyed. Nurses, even in hospitals where they are supposed to be well trained and thoughtful, sometimes take typhoid fever from their patients because they do not keep their fingers away from their mouths.

Tuberculosis

A young man in Maine died with tuberculosis. The cornet, which he had played, came into the possession of another young man. He died of tuberculosis. A third young man then had the instrument. He also caught the disease from the cornet and died. A teacher in a high school, an estimable lady who had tuberculosis, was in the habit of greeting her young lady pupils with a kiss. Four of these young ladies in four different families died with tuberculosis within a few years. Many other histories show with what certainty tuberculosis can be carried by things which pass from lip to lip, or are used in common by tuberculous patients and other persons—spoons, forks, common drinking cups, pipes, pencils, etc.

Scarlet fever Scarlet fever may be carried in the air short distances indoors, but there is a greater degree of certainty of its transmission by coming in contact with the sick person—by infecting the fingers, transferring the infection to the mouth or nose, etc. Letters written in the scarlet fever sick room, have been known to carry the disease to the children in families to which such letters were sent, many miles away. It is likely that such letters received their infection from the infected hands which wrote them, rather than from infected air. The scales which fall from the skin of persons during the process of peeling (desquamation), are likely to have due consideration, but the public underestimates the infectious character of the secretions from the throat, mouth and nose, or the discharge from the ear which may be a sequel of the attack of scarlet fever. These are sources of the infection which may spread the disease by direct or indirect contact infection.

Diphtheria In this disease there is great danger of the transmission of infection direct from the sick to other persons or by indirect contact infection when spoons, handkerchiefs or other things from the sickroom, are not properly sterilized before other persons use them. In numerous instances the heroic devotion of physicians to their sense of duty has caused their death from diphtheria, after applying their lips to the tracheotomy tube which has become obstructed by the infectious membranes from the windpipe and must be removed instantly to save the life of the sick child. Infection thus received is in massive doses, and the malignancy of infectious diseases seems to depend largely upon the size of the dose of infection received.

The final word is that the infection of many diseases is spread with the utmost degree of certainty by persons and things which have been in actual contact with the sick persons. It cannot be emphasized too strongly that such persons and things, before they leave or are carried from the sickroom, and before they are used by other persons or come in touch with them, should be sterilized (disinfected) in no uncertain way. And beware of infected fingers.—[*From a leaflet of the Maine State Board of Health.*]

XXVII

ON THE MANAGEMENT OF CHILDREN PREDISPOSED TO NERVOUSNESS

LLEWELLYN BARKER
Chief Physician in Johns Hopkins Hospital, Baltimore, Md.

Factors in the development of "nerves"

WHETHER a person becomes nervous or not depends upon two great factors: (1) the constitution which he inherits from his parents, and through them from his ancestors generally; (2) the influences to which his body, especially his nervous system, is exposed during life and particularly during childhood. There will always be differences of opinion among serious students of the subject as to the relative importance of these two factors; some assume that heredity or nature is the all-important factor; others maintain that this is relatively insignificant, and that environment or nurture accounts for everything; both views are onesided. Both nature and nurture are of fundamental importance and only by considering the two aspects of the subject fairly can sound ideas ever be arrived at.

Imitation rather than inheritance

Heredity and environment overlap in one period of life; during early childhood the individual is usually under the educational influence of his parents and exposed to their example. Doubtless much that is sometimes attributed to direct inheritance, is really due to the influence after birth, of imitation of the parents. Where the heredity is notoriously bad, it might be well, as Oppenheim suggests, to protect children who have the ill fortune to be born under such conditions, from the dangers of psychic infection in the parental environment; such children, taken away from home and placed under more favorable conditions, would have a better chance of counteracting the faults of inheritance.

In families in which nervous states prevail, it is a matter of great interest to know in how far the nervous tendency can be overcome by educational means, and especially to learn what to avoid because of its likelihood to injure the nervous system. Even in families in which no nervous taints exist in the parents or relatives, the children sometimes become nervous through faulty education and there is a growing desire on the part of well-informed people now-a-days, to make sure that the means of education they provide for their children shall be such that the nervous system will be protected and strengthened rather than exposed to overstrain and injury.

Ill effects of faulty nutrition

One fact, which has become ever clearer as medical knowledge has advanced, concerns the nutrition of the child. Faulty feeding in infancy and early childhood may lead to such impoverishment of the tissues and such stunting of growth, that the ill effects can never be recovered from in later life. A considerable proportion of the intellectual and moral inferiorities among our people, is fairly attributable to imperfect nutrition at this early age. Fortunately the public is now being so thoroughly educated to the importance of breast feeding for infants and of liberal and suitable diet during the early years of life, by family physicians and also through the excellent little manuals of Holt, Starr, Griffith and others on the care and feeding of children, that it is not necessary to dwell at length upon the subject. Plenty of good, simple food, including milk, meat, vegetables and fruit, with avoidance of condiments, coffee, tea and alcohol, is approved by all authorities.

Many parents make the mistake of allowing the caprice of the child to influence its diet. We now know the foods that are suitable for children, and knowing these, the children should be provided with them in suitable amounts, and should be required to eat of them, largely independent of choice. The child that learns to eat and digest all wholesome foods and who is not permitted to cultivate little food antipathies, makes a good start and avoids one of the worst pitfalls of life with which medical men are very familiar, namely, a meticulous anxiety concerning the effects of various foods, all too likely to develop into a hypochondriacal state.

Dangers of over-protection

There is a greater recognition now than formerly also of the fact that children should not be too tenderly brought up—that a certain amount of judicious hardening of the body is desirable. While faddists and extremists, in this direction, fall into grievous errors, making their children go barefoot and barelegged in the snow, and compelling the feeble, non-reacting child to take plunges in ice cold water, a still greater mistake is made by those who over-protect their children and who fail to accustom their bodies early to cool baths and to exercise in all sorts of weather.

The child who is brought up in such a way that he is very sensitive to slight changes in temperature, is bound to suffer from it sooner or later, and everyone is familiar with those who grumble at the weather. If children be suitably dressed and are early accustomed to taking a cool bath in the morning and to walks out-of-doors every day, rain or shine, and whether it be cold or warm, the skin and nervous system quickly acquire a tolerance for variations in temperature most desirable for health and for the feeling of well-being.

Protection of outdoor life and exercise

An out-of-door life for children leads them, unconsciously, to exercise their muscles more than is possible for the child who stays indoors. Not only physicians but also laymen from the old Greek times to the present, have been impressed with the importance of bodily exercise and harmonious muscular development for the welfare of the mind and of the nervous system. If we wish our children to be strong, energetic and courageous, if we desire to insure them against the nervous ills which follow in the wake of debility, inertia and timidity, we must see to it that all the muscles of their bodies are systematically and regularly exercised. For this purpose the plays of children are very important, and the only child, deprived of the companionship of brothers and sisters, unless pains are taken to supply other playmates for him, is much to be pitied. Besides play, walking, running, rowing, riding, swimming, paddling and sailing are all desirable forms of bodily exercise. In cities, and especially during the school year, systematic gymnastic exercises, calisthenics, have to be resorted to, and where no suitable gymnastic exercises can be obtained, parents will do well to teach older children some forms of exercises to be taken in the early morning. One of the best of the various systems worked out is that of a Dane, one J. P. Muller, who, in his little book "My System," outlines a series of exercises which anyone may carry out in his own room without apparatus. These exercises are physiologically well devised and I can recommend them heartily, not only for older children but also for both men and women who have to compress the exercises of the day into a very short period. The exercises recommended in this country by Luther Gulick, by Tait McKenzie, and others, may also be mentioned. I would call your attention also to the works of Lagrange.

Nervous children especially need regular exercise

An anxious mother will often ask to have her nervous child excused from regular exercises at school. This is usually a mistake, for nervous children, even more than normal children, require systematic, muscular exercises. It should, of course, be properly regulated, and where there is any doubt as to the reliability of the supervision of such work at a school gymnasium, definite instructions should be obtained from the family physician as to the character and amount of exercises to be undertaken.

Dangers of overstimulus

While emphasis is thus laid upon suitable bodily exercise for children predisposed to nervousness, a warning should be sounded against excesses in sports like tennis, football, basketball and other games, in which there is opportunity for competition or rivalry. Over-ambition in these directions is often most harmful, both to the body and to the mind of the child, and should be especially avoided where there is any neuropathic taint.

Creating resistance against pain and discomfort

In addition to the hardening of the body, the education of the child should include measures which increase the resistance of the child against pain and discomforts of various sorts. Every child, therefore, should undergo a gradual process of "psychic hardening" and be taught to bear, with equanimity, the pain and discomfort to which everyone, sooner or later, cannot help but be exposed. What I have said about clothing, cold baths, walking in all weather and at all temperatures, play and exercise in the open air, has a bearing on this point, for a child who has formed good habits in these various directions will have learned many lessons in the steeling of his mind to bear pain and to ignore small discomforts.

Physicians who work among nervous cases realize how often the child, who has been too much protected from pain, becomes the victim of nervous break-down later in life. I have seen many a woman who could bear great sorrow or suffer without flinching the pain of childbirth who still had no tolerance for the little ills of life. In such cases it is the idea, rather than the sensation, from which the patient suffers, and such abnormal ideas most frequently arise in those who have not learned in childhood to bear pain well or to adjust themselves without complaint to the disagreeable sensations and experiences which are essential to a normal bringing up.

Why women are more prone to nervousness

The boy who learns to tumble in a gymnasium, to stand the pain of boxing and fencing and wrestling, and to keep his temper while engaging in these exercises, will have subjected himself to a training which cannot help but stand him in good stead later on in life. One reason why women are more prone in later life to nervousness than men may lie in the lessened opportunity which girls have for bodily and psychic hardening in the games which they play and the life which they lead as children. Particular care should be taken with young girls who show any tendency to nervousness, to see to it that not too much concession is made to their likes and dislikes. Nothing can be more harmful to them than the gratification of caprice. Especially when a child shows a tendency to be nauseated by certain smells and tastes and to complain of noises or of sensitiveness to bright light, the family physician should be consulted and, provided no actual disease of the sense organs or brain is responsible, the process of psychic hardening should at once be begun.

Neglected, it is surprising to what vagaries such hypersensitiveness may lead. A lady recently consulted me on account of a most distressing state, askin that "in the name of mercy and pity," she should be given some help and told how to overcome an obsession which distressed her. The sound of her husband chewing at table completely upset her, and when he smoked the noise made by the puffing of the smoke was torture to her, the creaking of her mother's shoes as she walked about the house made her most uncomfortable during a period of several months. Obviously the abnormal idea in such a case caused the suffering, not the sensory impulse itself.

Another patient, a gentleman, who has had repeated nervous breakdowns, told me that they always begin in the same way. After a night of insomnia he will suddenly become unable to bear a strong light, and in lamp light he complains that he has a sensation of pressure in the head and an inability to relax his limbs. He feels at such times as though he will lose his mind and that he must have some relief or he will have to end his life. In one of these attacks in early life he stayed two years in a dark room and only at the end of that time would consent to remain in the light. Obviously here, too, it was not the sensation of light but the idea that the light would injure him which was the kernel of his condition.

Examples like the two just mentioned could easily be multiplied, but they will be sufficient to indicate the direction in which the psychopathic nervous system may easily tend. While in severe cases like these just referred to, the patients undoubtedly started out in life with abnormal nervous systems, it is quite conceivable that a judicious hardening in early life might have prevented the later shipwreck. I cannot too strongly recommend, therefore, the acquisition of tolerance of disagreeable feeling-tones as early as practicable in life.

An element in self-control

If children can be brought to behave normally in the presence of the disagreeable feeling-tone just discussed, the task of educating them to control themselves in circumstances which tend to arouse the stronger feelings, emotions and passions will be made much easier.

Dangers of allowing the emotions to go unbridled

Parents and nurses are too little aware of the dangers of allowing the emotions or passions to go unbridled. The problem should be recognized and attempts at the beginnings of its solution should be made in early infancy. If a young infant be kept in a normal routine, despite any emotional outbreak which it may manifest, an excellent start in the training of the emotions will have been made. If a child learns that by crying or by exhibition of temper, it can gain the thing which it thinks desirable, otherwise unattainable, a very bad start will have been made. Children should early be given to understand that they must control themselves before their desires will be gratified. How often has an indulgent mother given a child something it has asked for in order to stop its crying and to avoid a scene! It is hard to imagine anything, in the circumstances, worse for the child. If, instead, the mother had ignored the temper and told the child that it must say "please" and must wait a few moments after its temper has been controlled and the request has been made before the desire will be gratified, it would have been quickly possible to convince the child that it can get things by controlling itself rather than by emotional explosions. The substitution of self-mastery for emotional outbreaks is easy when begun early, but very difficult, indeed well-nigh impossible, if begun late in life.

Undue craving for sympathy

Another mental attitude that bears watching is the craving of the child for sympathy. Parents are really unkind in yielding too much to such a craving. True kindness will teach the child to rely more upon self-help.

Vacillation

Still another manifestation, common in children and fostered too often by the example of the parents, is vacillation. In one form of functional nervous disease indecision is a most prominent symptom. Parents should see to it that children are not exposed to a pernicious example in this regard. While there are some children of the "hair-trigger" type who have to be taught deliberation in the making of decisions, there are more who have a tendency to doubt and indecision and who should be taught that it's better, after due consideration, to make a decision, even though it be wrong and to stick to it, rather than to remain undecided.

The extent to which the fallacy of indecision may be carried is well manifested by some of the psychasthenic patients who apply to physicians for aid. Their indecision is often shown by the way in which they make an appointment with the physician, making and breaking it several times or changing the hour repeatedly before finally appearing in his office. One of these patients told me that it sometimes took him hours to decide what clothes to put on for the day. Fortunately such pathological cases are uncommon, but there is every gradation from the milder symptoms of vacillation to the outspoken and distressing indecision of the confirmed psychasthentic. The old motto, "When in doubt, act," should be kept in mind by parents who note a tendency to indecision in a child.

Mastering irritability

The control of the stronger passions is for some easier than the mastery of ordinary irritation, and nervous children should, both by example and by precept, be taught how to stifle irritability whenever it arises. So few adults have learned how to meet the daily friction that there would seem but little chance as yet for the nervous child constantly exposed to a bad example. As an observant writer said: "An important feature of the art of living consists in keeping the peace, the whole peace and nothing but the peace with those with whom one is thrown."

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School work

In any case nervous children should not be sent to school too early; preferably they should start a year or even several years later than the normal child. And in the schools they should never be pushed ahead too fast; competition is dangerous for the nervous child. The mistaken ambition of parents who desire their children to head the class is often responsible for serious injury to health.

Sleeplessness

Sleeplessness is always a danger signal. In children it is most often due to indigestion or to mental overstrain; occasionally to premature sexual excitations. If insomnia appear and, especially if it persist, the parents should consult a physician.

XXVIII

HOW TO SLEEP WELL

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Lincoln, Neb.

Location and lighting of the room

IF possible, the sleeping apartment should be on the second floor and have a south exposure, and, next to the living room, should be the sunniest, best aired, and driest in the home. The beneficial act of sunlight should need no insisting upon; nevertheless it is frequently overlooked. A room with a morning exposure is preferable to one having an afternoon sun. A room on the north side, receiving no sun, is not desirable for a sleeping apartment, no matter how hygienic it may otherwise be. There should be windows, as they not only serve for the admission of sunlight, but in the average dwelling are the only means of ventilation. Besides the regular ventilation of the room at night, windows should be thrown widely open in the morning for several hours, thus insuring a perfect ventilation of the room with pure air. This should be kept up in winter as well as in summer. The subjects of pure air and ventilation are treated in another article, and consequently will not be touched upon here.

Bedroom furniture

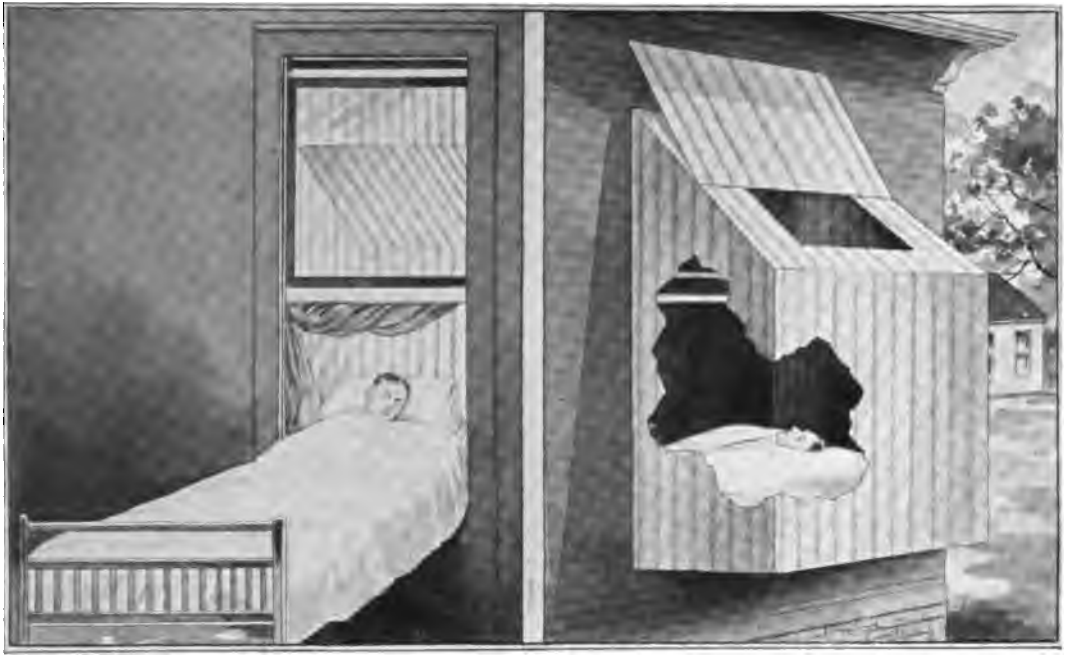
The furniture of the room should be simple, with as few draperies and hangings as possible. Oiled hardwood floors are the best, and carpets are best replaced with large rugs, which can easily be taken out and aired and disinfected if necessary. Painted walls and ceilings are preferable to paper, as they can be readily washed and do not form the nidi for germs to lodge in. Many instances are on record where poor and failing health had baffled the skill of the medical attendant, but where the source was finally traced to the wallpaper, containing arsenic producing chronic arsenical poison. A room should have no stationary wash bowls and should not communicate directly with toilet or bathroom. Metal bedsteads are preferable to wooden ones, as they can be more readily cleansed after a contagious disease, and do not afford so ready a lodging place for certain insects. An average bedroom, say 10x12 feet, should not be occupied by more than two persons. Individual beds cannot be too highly recommended. The chances of their transmitting contagious diseases is not so great, and certain secret vices are not so apt to be acquired as where several occupy the same bed. The most simple and best bed consists of a hair mattress and metal springs, with cotton sheets and woolen blankets, the latter being dispensed with during the heated term. Feather beds are only mentioned to be condemned. The temperature of the room should range from 60 degrees to 65 degrees, and be as uniform as possible. A lamp or gas jet should not be permitted to burn during the night, as the amount of carbon dioxide given off from a single lamp or jet is greater than that exhaled by an adult. The light is also injurious to the eyes and does not conduce to sound sleep.

Office and time of sleep

The practice of reading one's self to sleep is pernicious and one which parents should not permit. Sleep is nature's restorative and is the period during which the system replaces the waste material of the active portion of the day. Without regular and complete sleep the body will soon suffer, and this is especially true during the period of childhood up to full maturity. From the fourth to the eighth year a child should be ready for bed by eight p. m., and should sleep for not less than ten hours; from the eighth to the fourteenth year the bed-time hour should not exceed nine p. m. A later hour of retirement than nine p. m. should not be encouraged until after the fifteenth year. Children, like adults, vary in the amount of sleep needed, each being a law unto himself, and a child sleeping in a hygienic room should wake up bright and fresh if he has had sufficient sleep. Children that are extremely active during the day, either mentally or physically, will demand a greater number of hours' sleep than those of a more sluggish disposition. If a child is wakeful and restless, the cause should be ascertained and the child examined by a physician, if necessary.

Sleeping potions

The plan of dosing children with paregoric, laudanum, bromides, etc., is pernicious in the extreme. Many times a hearty meal too close to the bed-time hour, or undigested food, is the cause of the trouble. For children up to the twelfth or fifteenth year the evening meal should be the lightest of the day, and should not contain meat, pastry, or stimulating drinks. The old-time supper for children, of bread and milk, is excellent.



THE AËRARIUM

XXIX

OUTDOOR SLEEPING

CHARLOTTE BLATCHLEY McCALL
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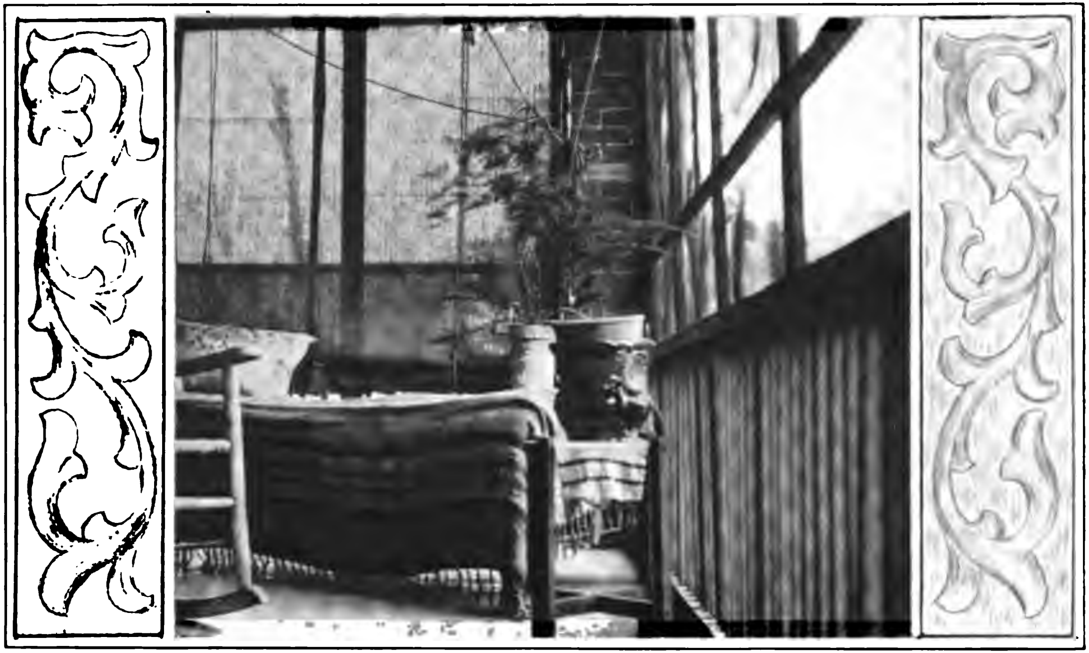
MOST people have certain well established ideas of their own about hygienic measures. These are frequently at wide variance with advanced scientific conclusions, but where authorities so often disagree, it is not surprising that the layman follows his own notions, though they may be nothing more than superstitions. The human organism is so complex and each part so closely related to every other part, that the relation of cause and effect in health and disease is not easily traced, and it is not strange that the amateur hygienist mistakes coincidence for results.

Rapid spread of outdoor sleeping

Perhaps no popular hygienic measure has had so sudden and widespread a following, or has received such unanimous approval from the medical profession as the practice of sleeping out of doors. Although the custom has been in vogue only a few years, the sleeping porch has become one of the essential features of the modern house. Real estate men and architects report that from seventy-five to ninety per cent of the new houses, in fact, "practically all," are provided with facilities for outdoor sleeping. The devices are many and varied, but the requirements are the freest possible circulation of air, and protection from storm and nocturnal insects.

The suitable place and arrangements Any roofed porch may be easily converted into an ideal sleeping room, and by doing part of the work at home the cost may be reduced to a minimum. One such room is in an upstairs flat, having a porch about seven feet wide by twenty feet long. A carpenter was hired for a day to make the screens. Brown duck was bought for the curtains and sewed together in suitable lengths, one for each end of the porch and two for the side. A strip of one by two-inch lumber made a stick for each curtain and two pulleys were placed at the top for the play of the ropes in raising and lowering it. These ropes are nailed first to the casing at the top of the curtain; they are then brought down behind it around the stick at the bottom and up through the pulleys. An end is left long enough to be easily reached when the curtain is let down the full length. The ropes are of ordinary clothes line. The curtains roll up freely, and the ropes are fastened with a half-hitch around two nails in the casings at the corner of the porch and looped up out of the way. They are within easy reach of the sleeper, who, in case of storm or approaching daylight, reaches up, loosens the ropes and the curtains drop instantly. In this case the stick in the bottom is tied to the lower rail of the porch balustrade to keep the wind from blowing the curtain. A clamp to fasten the curtain stick to any sort of anchorage at the porch floor is still more desirable and has been tried with satisfaction. The bed used is a sanitary couch which may be folded up during the day and is a comfortable piece of porch furniture.

The cost The cost of this sleeping porch was about seventeen dollars, and it is more than paid for in increased efficiency and pleasure in living, freedom from colds and total absence of doctors' bills. This is described



SLEEPING PORCH OF CHARLOTTE B. McCALL

in detail to show that no one need be without a sleeping porch. The expense might be even less with a smaller enclosure. If one has no roofed porch on the floor with the sleeping rooms, the making of a roof is an additional cost, but an awning will answer the purpose.

Any amount of expense may be added by the use of elaborate devices, but they do not add in the slightest degree to the hygienic value of the sleeping porch. In fact, the point should be emphasized that in so far as they obstruct the perfectly free circulation of air, they detract from the benefits derived by the occupant.

Wainscoted porches

When a sleeping porch is a part of the original plan of the house, it usually becomes only a room with a large number of windows. A wainscoting the height of the bed, and frequently higher, and windows more or less disappearing when the room is occupied at night are usually provided. These windows sometimes consist of three sash so that two-thirds instead of one-half the window may be opened. The pocket window that slips down into the wainscoting is not so satisfactory because it is not so easily and quickly adjusted. The floor in one of the new sleeping porches is of pietropulp, and has the baseboard continuous with it. This, of course, is very desirable as the pietropulp is a composition and is very readily cleaned. With the wainscoting, the porch becomes a room available at all times, but all the evidence shows that the greater the exposure to free air, the greater the benefit derived. The wainscoting obstructs the circulation of the air, and if the latter contains organic matter, it is associated with carbon dioxide, which being heavier than the other constituents of the air, will settle to the lower part of the room.

In passing, we may note, that if all of a large family sleep on such a porch, they might much better sleep separately in well windowed ordinary rooms.

Probably the ideal location for the sleeper who would get the maximum amount of recuperation from his hours of slumber, would be on the roof under the blue canopy of heaven provided, of course, that the canopy is blue and not overcast with moisture-giving storm clouds.

Window tents

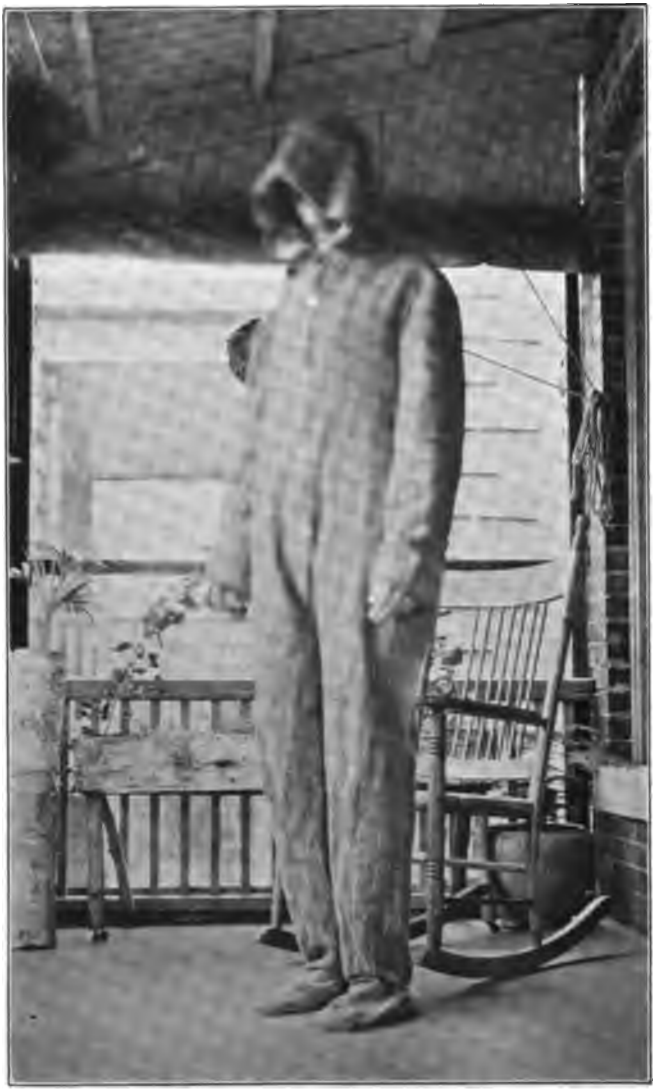
Various forms of window tents have been devised for situations where a sleeping porch is impossible. In the Aerarum, which is the best type, the cot of the sleeper projects over the window sill and an awning covers the window for protection in case of storm. A heavy curtain hangs from the lower edge of the window sash and prevents cold air from coming into the room.

In the Allen Health Tent, which covers the whole window, the user of the tent is supposed to wear a hood and thrust his head through an opening in the bottom of the tent when he sleeps.

The relative merits of these devices depend on the freedom of the circulation of air. A current of air, like a current of water, follows a straight line until deflected by some obstacle. The cot projecting over the window sill is undoubtedly the best substitute for a sleeping porch as there is no barrier to a free circulation of air on all sides except that next the house.

In the case of the awning extending into the room over the bed it must be remembered that the air within the awning would remain stagnant for the most part. There would be nothing to cause a deflection of the current of air into the awning to give the necessary circulation.

In short, there should be a free opportunity for the



DRESS FOR OPEN AIR SLEEPING

Designed by Charlotte B. McCall.

current of fresh air to carry the expired air away from the sleeper.

Outdoor sleeping not uncomfortably cold

There are few people who are not favorably inclined to the practice of sleeping out of doors in the summer, provided that they are well protected against mosquitoes and other pests. But to the uninitiated outdoor sleeping during the winter means a slow process of freezing. This is a great mistake. One must not sleep cold. It is neither healthful, desirable nor necessary. It must be remembered that the normal temperature of the body is 98.6 degrees, and if one can prevent the heat from being conducted away, the problem is solved.

Sleeping garments

The writer has found the following arrangements sufficient in zero weather; a single garment of heavy bathrobe flannel, bifurcated, and having feet and a hood; heavy paper under the mattress; a soapstone foot warmer, and in extreme weather one at the back. The possibility of a hot water-bottle's coming open or springing a leak at a most inopportune moment, is rather too disturbing for peaceful slumber and nothing is superior to soapstone for holding the heat. Cotton flannel sheets and two heavy comforts usually suffice. Sometimes an oilcloth is spread over the front of the bed, and in extreme weather a bathrobe is worn over the combination garment. These things do not interfere with freedom of movement to any extent.

It is absolutely necessary to prevent cold air from coming in around the body, and so one must learn to "tuck" the bed-clothing around himself—to lift the mattress and fold the clothing under it and to lift the pillow at the side of the head over the edge of the comforts. If there is a space at the back, the cold may come in and a pillow inside the bed is a good non-conductor of body heat. Others have found sleeping sacks desirable, and some follow the German custom of sleeping between feather beds. Sometimes the feather covering is quilted.

Always the last question of the skeptic is, "But I should think your nose would get cold!" and this really is the most vulnerable member. But an ample hood that comes over the face is usually a sufficient protection.

Physical advantages of sleeping out

It is impossible to describe the exhilaration felt when breathing the cold air, the while one is so snug and warm. There is a glow and vitality about the warmth which must be experienced to be understood, and is a sensation totally different from the lifeless chill of a cold room or the enervating influence of one artificially heated.

As oxygen is a prime requisite for the proper functioning of every organ of the body, the increased assimilation of oxygen, which is the effect of sleeping out of doors will help to relieve whatever ill the individual happens to be heir to. The nervously overworked waken in the morning refreshed and invigorated. Relief from catarrhal affections is reported by some. Many find that they do not feel the cold so much and that they do not require so many hours of sleep. Others find relief from digestive troubles. Whenever the system is exhausted it gives away in the weakest spot. As the fresh air builds up the whole system, the weaknesses, whether organic or functional, are relieved.

Problem of the curtains

But cold is not the greatest problem. When the wind blows, the noise of flapping curtains is often very annoying. Many devices have been employed to overcome this difficulty, perhaps the best being a spring roller curtain with clamps at the side. The spring roller may be at the bottom or the top. If at the bottom, the curtain may be raised a little to insure privacy; and in case of storm, the lower portion is often ample protection.

Practical results of outdoor sleeping

The writer has been sleeping outdoors since February, 1906, and so recently as 1909 was the unwilling subject of a column article in a leading metropolitan newspaper on account of this fad (?). There was no tubercular infection to make the fresh air necessary, but only great debility due to confinement during a large part of the day in a room through which circulated poisonous gases from furnaces. The effect was almost instantaneous, and immediate relief from the constant drowsiness, which was the effect of these poisons, was the reward of this unconventional innovation. It is gratifying to find that many who then were scoffers, are now enthusiastic advocates of the practice. Thousands of persons have been greatly benefitted by it and those who follow the custom have difficulty in restraining their enthusiasm.

It may seem unnecessary to the person in ordinarily good health to go to the inconvenience of providing all the paraphernalia needed for comfort in the open. But surely it is worth while to raise one's efficiency and working capacity to the highest point in this driving age, when one must still exist on twenty-four hours a day. This is especially true of those whose environment places them in the foul air of a large city. It may safely be said that no other one thing will do more for the general health and provide so strong a resistance to disease, particularly colds and other diseases of the respiratory tract, as living in the open air. It gives one a buoyancy, an exuberance of feeling, a clearness of the eye and a strength and courage for the battles of life, which by comparison make the trouble and expense involved sink into insignificance.

"All the windows open" is not the same as sleeping out of doors

To those who would proselyte for their hobby perhaps the most trying are the persons who "just the same as sleep outdoors—I have all my windows wide open." These people are not so cocksure as formerly, as many are already beginning to feel that there is a delight that they have not yet enjoyed. No one has ever stepped from the fresh morning air into the house, even where all the windows were wide open, without a feeling of regret at coming inside and a keen sense of the difference of the life-giving properties of the two atmospheres.

Given a room twelve feet square, with a ceiling 8½ feet high and having three windows, averaging 2 1-3 feet wide and six feet long—an unusual amount of window space—the wall surface is 408 square feet. The windows with the sash wide open, afford apertures to the amount of 21 square feet, leaving 387 square feet closed. If this room were a porch, the wall space would be 100 square feet and the openings 308 square feet. Does any one suppose for a moment that the resulting amount of fresh air is even approximately the same in both cases? The visible evidences of stagnant air, such as dust and cobwebs, are always found in the corners—is it not reasonable to suppose that disease germs and whatever malign properties may have emanated from the sleeper are lurking there, too?

It will be a surprise to many to learn that the most advanced scientific knowledge of the day is unable to give an adequate answer to the "why's" involved in this discussion. To the popular mind ventilation is merely a question of oxygen and carbon dioxide. But the problem is far from being so simple. At present, science seems to be sure only of what it does not know as the cause of the virtues of the open air. One writer on the subject says that "the annals of research nowhere more vividly illustrate our labored progress toward truth than in the history of the attempt to establish the factors which physiologically distinguish closed from open air."

It has been experimentally determined that the carbon dioxide in expired air is not accountable for the bad effects of indoor air even in a crowded room. Normally, neither the lack of oxygen nor the presence of organic matter in the air renders it injurious. The important thing is not so much the presence of carbon dioxide or absence of oxygen in the air of a room, as the quantity of these gases in the lungs. Hence, anything that makes for removal of carbon dioxide and increase of oxygen in the lungs, is beneficial. The difference between the oxygen and carbon dioxide content of inspired and expired air is insignificant, the main difference being in the high humidity and the temperature of the air. Many experiments seem to show that a blanket of warm, moist air is formed around the body and that circulation of the air is necessary to remove this. The "aerial blanket" remains undisturbed at night unless there is a free circulation of air around the sleeper. During the day the activities of the individual serve to dissipate this stagnant air. The combination of high temperature and high humidity is thought, by some advanced scientists, to be the most important cause of the bad effects of poor ventilation. A striking evidence of the moisture surrounding the body was noticed when a rubber blanket was used for protection against the cold. Every morning the blanket was lined with a thick coating of frost.

Possibly being out of doors where the motion of the air is unrestricted, facilitates the removal of this humid air laden with emanations from the body; there may be certain electrical conditions in the air which make for vitality; perhaps the unknown vital quality causes one to breathe more deeply. Whatever the scientific solution of the problem, we have sufficient practical and clinical experience to know that confined air has not the vitalizing properties of that in the open; and every artificial barrier to the free circulation of the air reduces its efficacy.

Out of door sleeping for children

Speaking of the secret of outdoor sleeping on children, a prominent physician says: "If the reconstructive value of fresh air in weakened and diseased bodies is so great, its constructive effect upon the developing constitution of the child during the period of its most rapid growth can hardly be overestimated. Very young babies after four or five weeks of age, if warmly covered, clothed and protected from the wind, can with great benefit spend most of the time out of doors."

Thirty-one thirty-seconds of the sustenance of the body is inorganic matter and most of this is air. Therefore, any mode of life which impoverishes the body in this respect is a foolish sacrifice of vital force. It becomes increasingly evident that nothing is more necessary in the human economy than a constant supply of the best air available.

XXX

HOW TO USE THE BATH

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Development of public hygiene

THE public hygiene of today dates from about fifty years ago, when the first system of vital statistics was established for England by Dr. William Farr. Today the outlook in the field of preventive medicine is indeed auspicious. Every city in our land has its health commissioner, with a corps of trained inspectors under him, and every hamlet its health officer, to decide on questions of vital importance to the community.

We have slowly learned the value of having our school and public buildings constructed on hygienic principles, the importance of location, sewerage, heat, ventilation, etc., receiving adequate attention. Questions of public hygiene are becoming more and more prominent in the social and political world, and all efforts to make the mass of people more contented and comfortable are connected with the questions of health in the largest sense. There is needed today an army of trained men and women in the field of scientific hygiene to carry its teachings to the masses. In this way the growing generations may be instructed how to avoid sickness and attain the highest mental and physical development. No matter how hygienic our school buildings are, if the pupil is subjected to improper hygienic surroundings at home, his condition is such that he cannot do the best work at school.

A child who has slept with half a dozen others in a filthy room, with insufficient ventilation, will awake the next morning with its blood charged with waste products and its brain in a foggy condition. One cannot expect the same amount and grade of work from this child as from one coming from a hygienic home, although the conditions of school are the same for both of them.

Physiology and anatomy of the skin

Among the agencies which the experience of the human race at all ages has demonstrated as conducing to the preservation of health and the prolongation of life, personal cleanliness takes the most prominent part. Physiology confirms the correctness of this popular idea. A few facts regarding the physiology and anatomy of the skin cannot fail to convince us of the important role of the skin in keeping the body in a healthy condition. In an adult the surface of the skin is equal to one and one-half square yards. The skin, with its countless nerves, blood vessels and sweat and oil glands, is one of the chief, if not the foremost, depurative organs of the body. Situated in and beneath the skin are two important varieties of glands, sebaceous or oil glands, and sudoriparous or sweat glands, the former serving the purpose of keeping the air and surface of the skin in a soft and pliable condition. But for our subject the sweat glands are of the most importance.

According to Dr. Krause, the skin of an adult contains about 3,000,000 of these glands, which consist of little coiled tubes about one-tenth of an inch in length, their inner end being surrounded by a tuft of minute capillaries similar in structure to the secretory portions of the kidneys. On the palms of the hands, with an ordinary magnifying glass, these minute openings can be distinctly seen. The entire secretory surface of these glands, besides secreting sweat, throws off CO_2, ammonia, and other waste products from the system, and partakes of the nature of both the lungs and the kidneys in the eliminative functions. In a healthy adult about one sixty-seventh of the body's weight is thrown off daily in watery vapor, which is equivalent to about two pounds, and greater than the lungs in the ratio of three to two. A rabbit, when one-eighth of the surface of the skin is varnished, dies. Dogs and horses, when one-half of the body is thus covered, exhibit a steady fall of temperature and show signs of weakness; both of these cases being due to the rapid giving off of heat. From this cursory view of the skin and its functions we can form some idea of the important work performed by it, and why we should try to keep it in a normal condition.

Classification of baths

Baths are usually classified according to their temperature, as follows: A cold bath is of a temperature of from 50 degrees to 75 degrees Fahrenheit; a tepid bath from 75 degrees to 85 degrees; a warm bath from 85 degrees to 95 degrees; and a hot bath from 95 degrees to 110 degrees. After the age of three years, three baths a week are sufficient, except during the heated summer months, when a daily bath is necessary for perfect cleanliness.

The hot bath

The hot bath (temperature from 95 degrees to 110 degrees) is not to be employed for general bathing purposes. Its principal uses are where a derivative effect is desired, or to cause profuse sweating, or to relieve nervous irritability and to procure sleep. In the convulsions of children depending upon congestion of the brain, the hot bath to the body, with cold effusions to the head serves an admirable purpose. It is also used to restore warmth to the body after a shock. Five minutes is usually sufficient time for a hot bath, and the child must then be wrapped in a blanket and put to bed. To render the hot bath more stimulating, a tablespoonful of mustard flour may be added.

Temperature of the sanitary bath

Baths with a temperature ranging from 75 degrees to 95 degrees are the ones which concern us most from a sanitary point of view. Children under three years of age should be bathed in water of a temperature from 90 degrees to 95 degrees; from three to ten years, in a temperature of from 85 degrees to 90 degrees; from the age of ten to puberty, from 75 degrees to 85 degrees, according to the season of the year and the susceptibility of the patient. The best time for the cleansing bath is near the bed-time hour, and it never should be taken less than two hours after a meal, as its repulsive effect will seriously derange the process of digestion. Only the purest and blandest of soaps should be used. Highly perfumed soaps generally should be avoided, as the perfume is generally used to disguise the odor of rancid fats used in their manufacture. Unscented castile soap is one of the best. A pure glycerine and an unscented castile are the purest on the market.

By using warm and tepid water a less amount of soap and rubbing is necessary to loosen up the scales and debris accumulating on the skin. A moderate amount of rubbing is necessary and highly beneficial in stimulating the glands, nerves and circulation. After bathing, the body should be thoroughly dried with soft towels, and not with harsh ones, as is frequently advised. Powders should not be generally used, unless there is chafing in hot weather, when some simple powder may answer. Children having a very delicate skin and subject to eruptions are benefitted by avoiding soap and using an occasional oatmeal bath, which is made by adding oatmeal flour to the ordinary bath.

Cold baths

Cold baths are not used merely for their cleansing effects, but principally for their stimulation of the system. After being plunged in the water there is a momentary shock, the respiration is gasping, the pulse is increased in frequency, the surface of the body becomes blue, and the features have a pinched appearance. This is followed by a reaction in a few moments, when the skin becomes red, the pulse fuller and stronger, causing an extremely refreshing sensation throughout the body. On account of the shock, the cold bath must be used with caution in young and feeble children, and in a general way should not be given to children under ten years of age. With children over ten, with lax fiber, bloodless, poor digestion, who take cold easily, are fatigued after slight exertion, and who seem unrefreshed after a night's sleep, there is no hygienic procedure equal to a cold bath.

The mode of life of the present generation, which differs from that of the former times by intensifying the nervous energies, and the great competition in life, demands the use of all hygienic means which will bring the body up to and maintain it in a vigorous condition. The cold plunge causes a contraction and a subsequent relaxation of the peripheral blood vessels, and these vessels become endowed with the same tone and vigor as the voluntary muscles by gymnastic exercises, and the whole system is stimulated to throw off waste material and carry an increased amount of oxygen to every cell. The hardening effect which results lessens the tendency to take cold which so frequently results when the body is exposed to sudden changes of temperature, or when the surface of the body is rapidly cooled. The best time for a cold bath is upon rising in the morning. The most useful method is the gradual accustoming of the body to the shock from cold water which is always followed by a reaction if the temperature be correctly chosen.

The following method, by Dr. Simon Baruch, is most excellent, and by following it out according to details, delicate persons soon become accustomed to its use: In the bath tub is a foot of water of 100 degrees Fahrenheit, in which the persons taking the bath stands; and the body is rapidly sponged with water at 80 degrees Fahrenheit and is reduced daily two degrees until a temperature of about 50 degrees is reached. When this has been done a few days, a daily plunge into water of about 80 degrees is advised, the temperature of which is reduced by two degrees a day until 50 degrees is reached, or below this if followed by an agreeable reaction. This is manifested by a pleasant warmness and an absence of cold hands or feet. The addition of half an ounce of sea salt to a gallon of water will make it more stimulating and insure a prompter reaction. This bath should be taken in the room of the temperature of not less than 65 degrees.

XXXI

THE HEALTH OF GIRLS

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FROM every part of the country come complaints that the schools are undermining the health of girls. It is being said that the mental tasks assigned them are excessive and that they are not given sufficient leisure to recover the energy expended in studying. Some special investigations made upon high school girls, have shown that a large proportion of them are anæmic and nervously exhausted when they complete the secondary school course; and the cause is laid at the door of the school, alike for what it does and what it does not demand of its students.

Girls with no physical work

The writer has been observing a group of girls as they have been passing through childhood on into the high school period, and he has noticed a tendency among them which seems to be more or less general today, and which appears to be at the bottom of most of the physical difficulties of adolescent girls. These particular girls live in the city, and they have been reared in homes where the work has been done by hired people, so that they themselves have had no opportunity to share in it. There has been no physical work of any sort which they have been required to do, except to dress themselves, and in certain cases, they have had assistance even in this. On account of the restrictions of the city, they have had almost no opportunity of late to indulge in lively games and plays out of doors, involving the ready and effective use of all members of the body. In their group life, now, they will gather together and visit, or sit and read. They have frequent parties in which they dine together, and they attend dancing classes once a week, where they have a little physical exercise, but of a very limited sort, however. Some of them spend a little time in the summer in the country, or at the seashore, and while on a vacation in this way, they have opportunity to engage in physical activities, but even so, the conditions under which these exercises are taken are rather formal and restricted, with the result that they have little influence upon the habitual attitudes and tendencies of these girls.

The result

So, it would be within bounds to say that after the age of nine or ten, they have engaged in no activities which demand muscular skill, co-ordination and endurance. They have had little or no training which has developed in them bodily poise and physical control. They have had practically no experience which would arouse in them a consciousness of dynamic bodily attitudes. In their walks together they usually busily engage in describing some social experience in or out of school, and even then they do not assume vigorous, healthful, vital bodily positions. The physical in them has become wholly subordinated to the mental and the emotional nature. Their life in and out of school stimulates intellectual and emotional activity solely. They have a gymnasium in the high school, but it is used only once a week by the girls; and then whole masses of them are put through a more or less mechanical gymnastic drill, which fails altogether to establish any consciousness of bodily position or carriage, or to give sure command of any but a very limited portion of the muscular mechanism.

Whole systems of muscles in these girls are as though they did not exist at all; they have little feeling of how to energize them. They have no sense of stretching muscles or calling into play those that govern the functioning of vital organs. Consequently various parts of their organisms are rarely exercised, with the result that they tend to atrophy, or at least to lose their power or resistance to disease. Health means resistance to the attacks of the body's enemies, and this resistance can be secured and maintained only when all the bodily organs are kept in an energetic condition through proper stimulation.

In respect to these special girls, their carriage, and even the appearance of their features indicated the dominance of the mental in their lives, to the almost complete neglect of the physical. It is significant to note that in some of these cases the head is continually extended forward, as if in the attitude of attending to an object immediately before the eyes. The shoulders are habitually bent forward and rounded, and the chest is constricted. This, it will be apparent, is the attitude commonly adopted when one is reading a book. If this attitude is frequently assumed, it readily becomes the habit of the individual's life, and it is the first serious obstacle to the maintenance of health, whenever a crisis is encountered, which is usually the case when the adolescent period is entered.

The remedy

Some of these girls now have a more or less serious struggle against disease, and the parents and even the physicians do not seem to understand the reason for this. But one who will observe their habits, can see that sufficient vigor is not developed to secure the body against inroads of invaders. There is no consciousness of the body, and hence no tendency to call its various parts frequently into vigorous activity. The remedy for this unhappy state of affairs is simple enough, if we should think it worth while to apply it. In the first place, if we are to solve this vital problem in any thorough-going way, we must make it possible for girls throughout their entire developmental period, to engage in activities which will require physical co-ordination and control, and develop their feeling of muscle as amenable to will. It is possible to develop a sense of pleasure in calling frequently into play the muscles of all parts of the body, in the effort to stretch them to the limit of their capacity, and continually to extend their capacity in this respect. Once give a person a feeling for this sort of thing, and he will carry it on as systematically as he breathes, and he will find pleasure in it. This can be accomplished effectively only when one has some useful work to do, or when girls engage in games and plays which encourage the use of all parts of the muscular mechanism. It is not enough to have formal gymnastics occasionally; we should develop in our girls habits of maintaining vigorous and healthful and resistant attitudes, so that they will, as regularly as they do anything else in their lives, assume these attitudes. The muscles and bodily organs may be thus kept in good tone at all times.

XXXII

HYGIENE AND THE BOY

INSTRUCTION OF BOYS IN THE PROBLEMS OF PHYSICAL LIFE

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EARLY Christian ideals of this country assumed that all were sinners and full of violence. Conversion was thought so to change the life as to eliminate evil. Bushnell's ideas on nurture were vigorously combatted. We are now in danger of having the pendulum swing too far away from the ideals of conversion. Ethical education may, unless we are careful, come to occupy too large a place in our scheme of securing clean living and proper physical habits. France has taught ethics for a generation with the avowed purpose of improving the morals of her people. During this period crime has increased. One French teacher reported that her best scholar in ethics was the biggest knave in the lot.

The fallacy of knowledge

The idea that knowledge brings virtue needs to be vigorously combatted. I emphasize this idea because the various societies for social and moral prophylaxis emphasize the value of instruction. Ethical instruction is valueless unless somehow it is vitalized. The foundations of character are not to be found in the intellect but in the emotions and the will. The acquisition of knowledge, in other words, does not seem to be directly related to virtue. The boy needs to form habits rather than learn ethical maxims. We should strive to control his environment and direct his inherent interests in forming right habits.

Instruction is important. It is probably true that young children and particularly girls are led into vice through ignorance. Boys, during later adolescence and early manhood, know of the dangers of illicit intercourse even though they may not sense entirely the gravity of venereal diseases. We have gone through a period of false modesty when little or no instruction was given. We have now entered upon a period when sex instruction is given. Unless the instruction is given on a high moral plane the information may degenerate into mere smut talks.

Plans for high school boys

The colleges have already found that knowledge does not always lead to virtue. What shall be the methods in training the body in the grammar and high school? We should do two things:

1. Furnish a healthy environment for the boy.
2. Train his will.

A healthy environment means, in a large measure, a revolutionary reconstruction of our practices in training boys. It means:

1. That boys are not to be kept quiet for the greater part of five hours per day for ten months in the year; racial history is all against this method of rearing boys. Development has come through activity of the neuromuscular system. It has come in an orderly progression. Each individual recapitulates in his own body the history of living things, not merely the history of the human species. In accordance with Hughlings Jackson's three level theory in the development of the central nervous system, the basic centers controlling nutrition, respiration and circulation de-

velop first, then those governing motion, and lastly, those association ideas, which are most closely related to character building. The drunken man, for instance, first loses in moral sensibility, then in ability to use the smaller, finer muscles, and, lastly, the power of co-ordination in larger, coarser muscles.

2. Boys' activities are to coincide with the periods of their development. During early boyhood the activities are individualistic and use the large group of muscles. The activities must be varied during this period. In adolescence the group games appear in their most strenuous form. Endurance and bodily strength are the ideals of the boy at this time. The normal boy must have a chance for these activities. This means playgrounds and recreation centers, Y. M. C. A. gymnasiums, the opening of school buildings and churches for boy activities.

3. The school room in which he spends his days must be free from dust and furnished with air, fresh and moist. The air in the ordinary school building is loaded with bacteria and is as dry as that on the desert of Sahara. The lungs ought not to be the water jug which furnishes the moisture to the air.

4. The moral environment in which his activities are conducted must be pure and wholesome. The leadership must be strong and virile. Honesty, fair play, cleanness of life and speech, must be habitual for the leaders and for the boys.

His will

The boy's will should be trained by action rather than by the memorizing of ethical maxims. We have had, in the last few years, to refuse admission to the basketball floor to some leaders in Christian work because they were unfair. They were experts in this and shining lights in the church, but had never learned to play fair. The boy needs practice in playing fair, in keeping his temper, in cleanness of living and speech. Religious education has made the mistake of training too exclusively by instruction.

Emotions

The emotional and volitional in children predominates over the intellectual. This is also true for many grown people. We should study the impulses of children, striving to associate pleasure with the good ones and pain with the bad ones. Place good models before children. They are born imitators. They do not study creeds but men. Train whenever possible by indirect means; suggest actions rather than ideas, what to do, where to go, how and what to read, the ideal boys to associate with, etc. Aristotle says: "It is by doing just acts that we become just, by doing temperate acts we become temperate, and by doing brave deeds we become brave." Horne says in his "Idealism in Education": "Morals are conduct; ethics the science of conduct—morals should precede ethics. He who is moral, whether he understands ethics or not, can easily come to do so; he whose morals are not yet habits cannot intellectually realize ethics."

Clean ideals and games

Praise the virtuous act publicly and privately, encourage by example and by object lessons acts of heroism, devotion, chivalry, courtesy and perseverance. Athletics, games and other physical activities afford the best opportunity to practice these virtues. Do not preach virtue, practice it. Hold up as illustrations, historic and local examples. Encourage effort in virtue. Temper fits during games are common in boys; praise them when they overcome them. Young men themselves note evidences of self-mastery. Require effort and praise success. Accomplishment or results, rather than fairness of method, are common in boys' plays. The spirit of the athletic league of the Y. M. C. A. illustrates what I mean in holding up ideals. The league endeavors to foster clean sport between gentlemen.

The following statements express the spirit to be sought and maintained in such sport. It is the privilege and duty of every committeeman and person connected with the league to embody these principles in his own actions and to earnestly advocate them before others.

1. The rules of games are to be regarded as mutual agreements, the spirit or letter of which one should no sooner try to evade or break than one would any other agreement between gentlemen. The stealing of an advantage in sport is to be regarded in the same way as stealing of any other kind.
2. Visiting teams are to be honored guests of the home team and all their mutual relationships are to be governed by the spirit which is understood to guide in such relationships.
3. No action is to be done or course of conduct pursued which would seem ungentlemanly or dishonorable, if known to one's opponent or to the public.
4. No advantages are to be sought over others, except those of superior skill in the playing of the game.
5. Advantage should not be taken of the laxity of officials in interpreting and enforcing rules.
6. Officers and opponents are to be regarded and treated as honest in intention. When opponents are evidently not gentlemen, and officers are manifestly dishonest and incompetent, future relations with them may be avoided.
7. Decisions of officials are to be abided by, even when they seem unfair.

8. Ungentlemanly or unfair means are not to be resorted to, even when they are used by opponents.

9. Good points in others should be appreciated and suitably recognized. Physical activities allow choices. Right choices mean right habits. Formal instruction in physical habits for boys I would still make indirect.

Hygiene

I would give no formal instruction in personal purity if it could be avoided. Instruction in hygiene should be directly related to the activity of the boys. I would study the air in which they worked and played. I would measure size and range of movement of their lungs. I would take functional tests of heart rate during rest and exercise. Every boy should be stripped and examined at least twice a year. This will afford opportunity for informal instruction of the best kind.

The mouth, teeth, skin, glands, including the sex glands, would come in for suggestions, not theoretical, but in direct relation to exercise and living. Most of our instruction in hygiene has been unrelated to life. I would suggest, repeatedly and strongly, the fact that the sex glands matured late and should be left alone except for purposes of cleanliness. I would by example, by the history and literature used, and by the instruction in hygiene given, stimulate him to put into practice at once the ideals taught. I would minimize definite sex or moral instruction for boys, and emphasize the formation of habits. I should use the gymnasium and playground to foster the rugged virtues of clean physical living, honesty, fair play, self-mastery, and I would use the courses in history and literature to stimulate the emotions and stir the will to definite action.—[*From Religious Education, by permission.*]

XXXIII

THE "HOWS" OF THE CIGARETTE QUESTION

EDWARD HYATT

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How to talk to boys about smoking

BOYS, there are such a lot of you that I don't get to write to you very often. I think this is very important to you, else I would surely not take the trouble to write it. The fun and pleasure and success of your whole life and that of your friends and relatives, are going to depend very largely upon what you do during the next ten years; and I am writing this to ask each particular one of you to stiffen up his will, to make up his mind, to hang to it like grim death, in resolving to get along without cigarettes for ten years to come. No one can do this for you. If you haven't the will to do it yourself, it won't be done.

Believe me, you have a long and tough old fight ahead of you, to keep your head above water and take care of yourself and make a living for fifty years and more in the fierce competition and strife of the world. All the time you'll keenly need every ounce of strength and steadiness and wind that you can summon to your aid.

But here. If you take on the habit of smoking before you are grown, you weaken your strength and steadiness and wind. The other fellow will get away with you and you will go down to humiliating defeat many a time for that reason—simply because in boyhood you drugged yourself so that you are not so tough and strong in body nor so cool and steady in mind as you would otherwise have been.

I say this knowing that cigarettes are gay and stylish—for many stylish things will injure and weaken us; say it knowing that you will see some handsome, well-dressed, striking fellows gracefully smoking them—but still more so the bedraggled bums and hard-faced criminals; say it knowing that you are anxious to be a man and that perhaps the very man you would most like to be is himself a smoker—but if you go with me to the reformatories and prisons you will see thousands of miserable and unfortunate fellows you would *not* like to be—they, too, are smokers; and their smoking helped to drag them down.

It is not enough to see that a good many admirable boys and men are smoking, without apparent damage in any way. We should use our brains to think with instead of merely as filling for our heads. If we look about and think, we will see that the boys who use cigarettes are most likely to be poor specimens of humanity, thin-faced, nervous, impatient, unable to study or stick to a job. We will see that athletic managers do not want them, that business men would rather have some one else, that they are undesirable to practical employers. They have a poor chance among the strongest and best people everywhere. So it will always be with them.

This is why I ask the boys to do without cigarettes for the next ten years. It would be a great thing for every one of you, and a great thing for the strength and power of the State. How strong is your will? Can you do it?

For a final scrap to linger in your future memory, let me repeat what seem to me the most affecting words I have ever seen on paper, written by one of the wisest citizens our State has ever had:

"Your first duty in life is toward your *afterself.* So live that your *afterself*—the man you *ought* to be—may in his time be *possible* and *actual.*

"Far away in the years, he is waiting his turn. His body, his brain, his soul, are in your boyish hands. He can not help himself.

"What will you leave for him?

"Will it be a brain unspoiled by lust or dissipation, a mind trained to think and act, a nervous system true as a dial in its response to the truth about you? Will you, boy, let him come as a man among men in his time? Or will you throw away his inheritance before he has had the chance to touch it? Will you turn over to him a brain distorted, a mind diseased? A will untrained to action? A spinal cord grown through and through with the devil grass of that vile harvest we call wild oats?

"Will you let him come, taking your place, gaining through your experiences, hallowed through your joys, building on them his own?

"Or will you fling his hope away, decreeing, wanton-like, that the man you might have been shall never be?

"This is your problem in life; the problem of more importance to you than any or all others. How will you meet it, as a man, or as a fool?

"When you answer this, we shall know what use the world can make of *you.*"

Some things that teachers can say about cigarettes

Some months ago it was my fortune to hear this cigarette question discussed in a lively and spirited style at a teachers' institute in northern California. One young, vigorous and enthusiastic teacher expressed herself frankly. Said she: "What's the use to tell the children about the effect of tobacco? We can talk to them all day and then they go home at night to see the very people they think most of in all the world, smoking like a house afire! They see people hale and hearty who have been using tobacco every day for fifty or sixty years! They see the rich and prosperous enjoying it! They constantly see educated people, fashionable people, using the weed! What's the use after that for the school teacher to tell them that it is poisonous, that it stunts their growth, that it kills them off, and all that? We waste our time and get nowhere in that way."

Now, it seems to me that very many teachers have about this same idea, although not all are so free to express it. It is perhaps worth while to get some answers to the question from some of the bright people of the State who have given thought to it. Therefore, the question was sent to half a dozen well-known persons. The results follow.

"To the above protest, every teacher must agree; and yet would the great fight between truth and error that has been in progress since man was, ever have accomplished anything if men and women had listened to and acted upon such arguments? Is not this fight against tobacco, one phase of the eternal conflict between the powers of good and evil?

"May it not be possible for every teacher to have a clear concept of an ideal man and an ideal woman? One that shall embody the highest attainments—intellectual, moral, and physical—of which mankind is capable, and keep these ideals before the children for their admiration and emulation? This may require more knowledge than we possess at present, but I believe it possible.

"A few arguments follow: Athletes while in training must not use tobacco or liquor. Why? Explorers, both in arctic cold and in tropical heat, have proved that those best able to endure extremes of temperature use neither of these drugs. The moloch of war, both in the army and the navy, will have none but the best of our youth and records show that a large percentage of those unable to pass the physical examination for entrance to Annapolis or West Point are users of tobacco and have the 'tobacco heart.' Space will not permit further illustrations. Use them and do not be discouraged if you have no immediate results.

"Far down in the tropical seas little polyps work their brief lives through, die, and others take their places. Finally, a coral rock reaches the surface. It is beaten and battered by wave and current, by storm and sunshine. Passing birds or other agencies bring seeds to its surface and in the course of time the tropical island, verdure clad, commands the admiration of every beholder. The polyp worked on never knowing the result; so we may see no effects from our efforts but must have faith to believe that the final result will be a better humanity."—*Agnes Howe.*

"Smoking can not be assumed to be a safe and harmless practice at any age, but it is much less likely to seriously injure a boy after his general physiological development is completed than before this time. Nicotine, like all other drugs or poisons, produces its physiological effect with a progressively diminishing dose as the age decreases. The tobacco habit in young boys tends to rapidly grow beyond control. Continued smoking is almost certain to develop in a boy a chronic inflammation of the throat and upper air passages, with eventual excessive secretions from the mucous glands.

"I consider the best argument against children's smoking to be that advanced by the adult smokers themselves. Almost universally smokers will say, 'Don't let the kid smoke before he is sixteen or eighteen. It isn't good for him. He will get to smoking too much. I smoke too much myself.' Why? This is one of those intangible facts for which science has as yet discovered no definite explanation."—*Dr. W. F. Snow.*

"You don't need to tell the boys that tobacco is poison. Ask a boy who is about to take part in any contest requiring endurance, alertness of mind, and quick response of muscle if he thinks half a dozen cigarettes will help him to win the event. He knows. Ask the boy if he would like to have his sister's and mother's breath smell as do those of smokers. Would he? Great corporations, like railroads, have no sentiment, but they are refusing to retain in their service men who use cigarettes. The employers of men want active minds, clear brains, hearts capable of endurance. They must have profitable workmen, not men stupefied by nicotine. To those who do not believe tobacco produces the effects related above I can only say try an experiment, smoke a half dozen cigarettes and then try to do some important work. No matter how many of our friends are addicted to bad habits let us try to be sweet and clean and help to make a better race than the present."—*Mr. Graham.*

One method of handling the cigarette evil in a school

The High School Record Book containing the records of every boy who has been enrolled in a California school at any time during the past eight years was brought before the school and the records of the tobacco users laid bare to public gaze.

Not a single high school boy in the past eight years and probably in the history of the school, who has been addicted to the use of tobacco, has graduated from the school with sufficient credit to give him entrance to the university.

The principal, Paul G. Ward, in his talk revealed a deplorable situation, for it was shown that nearly one-half of the high school boys during the past eight years have been addicted to the use of tobacco. And he proved by the records that this habit nullified their efforts at school.

He took the records of the 69 boys enrolled between the years 1902 and 1908 and compared the work of the tobacco users and those who did not use it. The tobacco users certainly got it in the neck, as the records show.

Of those 69 boys 32 used tobacco, a sad commentary in itself—37 abstained. About half of the school boys have had the tobacco habit. During this time the school has graduated from its four-year course fifteen non-tobacco users and only six tobacco users. AND OF THESE SIX THREE HAD TO TAKE FIVE YEARS FOR THE COURSE AND FINISHED BADLY, and of the three left one used tobacco only during his last year and another during his last two years.

NOT DURING THIS ENTIRE TIME HAS A TOBACCO USER GRADUATED WITH SUFFICIENT CREDIT TO MERIT A RECOMMENDATION TO THE UNIVERSITY.

The non-tobacco users meanwhile have made a good record. Fifteen of them have graduated as against six of the tobacco boys, none taking more than four years. Twelve of them have been recommended to the university for scholarship and eleven of them have gone on to higher institutions of learning.

It was pointed out that the high school period is the most critical period of the boy's life; the adolescent period when he is changing from a boy to a man, and that to take up the tobacco habit at this period would almost certainly nullify any effort made with his studies.

The principal said: "Dr. David Starr Jordan, President of Stanford University, says: 'Such boys are like wormy apples. They drop long before the harvest time. Very few of them ever advance far enough to enter college. Very few of those who enter last beyond the first year.' I want to add my experience to that of Doctor Jordan. I have been in charge of various California schools for the past eighteen years, most of the time being supervising principal of both grammar school and high school, and invariably in that experience the tobacco boy, if he ever reached the high school, did so in a weakened condition. Never, in those eighteen years, have I graduated a tobacco boy from the high school with sufficient credit to gain entrance to the State University. Not one of them has ever made any serious effort towards a higher education.

"The whole school course is strewn with tobacco wrecks."

In evil effects upon the growing organism, tobacco is a close second to alcohol, as is shown by the statistics of Doctor Seaver at Yale. His conclusions, based on Yale Freshmen for nine years, show the tobacco user to be inferior in almost every particular. The average lung capacity upon entrance to the university is eighty cubic centimeters less; the height is seven millimeters less; and the average age of enter-

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After the Painting by Elizabeth Nourse.
In the Art Institute of Chicago.

ing college is fifteen months greater. "The observed rate of growth at this age would lead us to expect that the smokers from their greater age would surpass the others by one kilogram in weight, two millimeters in height, and one hundred cubic centimeters in lung capacity." Conclusions based on three and a half years of undergraduate life show both in Yale and in Amherst a distinct advantage in development in favor of the non-smokers. In Amherst they have increased in weight twenty-three per cent, in chest girth forty-two per cent and in lung capacity about seventy-five per cent.

The danger of cigarettes for growing boys

"The moral danger of smoking cigarettes lies in the pleasant languor produced. This soothed and carefree feeling is really the symptom of a grave danger—the smoker feels so much at peace because the angel of duty has been lulled to sleep by poison. To speak literally, the nerve center of the will is partially paralyzed by the poisons introduced into the system through the smoke, and the smoker finds himself careless of what is to come, indisposed to action, content to nurse the illusion that his mind is unusually active, and to do nothing positive or aggressive. This effect is so subtle and so gradual that the average cigarette smoker rarely becomes conscious of it at all. Others notice in him the absence of initiative, but he does not. He is discriminated against by business houses, but does not understand why. The writer of this became conscious of this weakening action upon the will only after he had ceased the use of cigarettes and then gradually became aware of the return of will power that was one of the symptoms of *convalescence,* so to speak, from the disease—for cigarette smoking really is a disease when it has become a fixed habit.

"This is the real explanation of the moral let-down noticed in cigarette smokers. The will is weakened, and with it the power not only to achieve positively, but also the negative power to resist evil suggestion.''—*A Smoker.*

''Dr. Luther H. Gulick, former physical director of the public schools of New York City, and now director of the Department of Child Hygiene of the Russell Sage Foundation, once said to me:

''Tell the children the exact truth about tobacco. Do not exaggerate.'' The exact truth is that tobacco is invariably bad for growing boys; whereas its effect upon grown men varies from entire harmlessness to extreme harmfulness. Tell the boy that when he has grown up, and his body does not need all the power it has to feed his muscles and his nerves, he may then safely try tobacco, and, if he finds no bad effects, safely continue to use it. The question, so far as men are concerned, is wholly a matter of observation and common sense. It is perfectly true that a careful doctor can not find any evidence that tobacco injures some men who use it habitually. Hence it is folly to tell boys that all use of tobacco is injurious. It simply isn't so, and the boy knows it.

''Furthermore, it is bad policy to tell a boy that tobacco is necessarily injurious to grown people, because you thereby forfeit the aid of your strongest ally, the boy's father. If the boy comes home and says the teacher told him that tobacco was bad for boys but not necessarily bad for men, the father will almost certainly agree with the teacher's doctrine, and add his influence to that of the teacher in the effort to get the boy to refrain. But if the boy goes home and tells that the teacher said that all tobacco was harmful, under all conditions, the father will almost certainly retort that the teacher has been talking nonsense, and doesn't know what she is talking about anyhow. Instantly you have the teacher's influence lowered to zero in the boy's mind. He respects his father, and the father has criticized the teacher, and naturally he agrees with the one to whom he should properly look with the more faith.

"Imagine the feelings toward his teacher when a boy whose father uses tobacco hears the teacher say that the habit is "filthy" or "disgusting." The boy resents it, of course. And his father is not to be blamed for resenting it either. Tact is essential in any effort at reform.

"And the proper thing to do is to tell the truth."—[*E. French Strother.*]

XXXIV

HEALTH AND STRENGTH BUILDING SIMPLIFIED

R. H. KRANZ, M. D.

Physical culture must be a habit

ALL physical culture systems are of little practical value unless they become a habit. When they have reached the stage of an established habit, then they become of inestimable service. Such a habit does not consist in a mere ten minutes or more of strenuous gymnastics, but rather in a continued, constant "living up to" a standard of physical excellence, whether at work or at play, whether in action or repose.

Physical culture not muscular exertion alone

Rid your mind of the idea that physical culture solely implies physical efforts or muscular exertion. Physical culture of the sort really worth while, is something that never entirely leaves one's personality. One who applies it compels admiration at every move, whether it be in the carriage, posture, walk or movements. The pitch and play of the muscles at every turn express the thoroughbred man or the thoroughbred woman.

Unless the physical culturist finds some fundamental principles he can actually apply in his daily life, he is losing valuable time, and necessarily progresses slowly. It is unwise to expect to undo twelve hours' daily misuse in so many minutes each morning or evening—a useless attempt in itself. Unless attention is paid to one's daily muscular habits, the building process is heavily handicapped. Everyone can understand the impossibility of attaining a high standard in any form of culture if the principles taught are forgotten and ignored in general life. Elocution and voice culture, for example, require the constant, thoughtful attention of the student in breathing, tone placing, resonance and mental concentration. etc., until all conscious training becomes an automatic, effortless action.

High pressure living demands practical hygiene

Modern, high-pressure living demands measures of practical hygiene that are readily grasped and that can be automatically executed. A student who knows ever so much about physical culture but who fails to embody his knowledge in his personality falls short of the mark. We have a right to demand a proper carriage, a well-poised body, a flexible spine, an elastic step, diaphragmatic breathing, resonant voice and grace in movements. These elementary requirements, I am sorry to say, are nevertheless attained by but a very small percentage of students. In order to make plain how easily the student may school himself—or herself—to live up to a standard of physical culture, I will mention ten rules which no health-seeker should neglect. Anywhere and at any time can and must these rules be lived up to. Only the first two require privacy, and as these are only occasionally to be executed, opportunity is easily found.

Ten simple rules of hygiene

1. Stretch every muscle in your body.
2. Keep your spine flexible by spinal rotation.
3. Carry the weight of your body in a proper manner.
4. Hold your neck in line with your backbone.
5. Brace yourself with a firm "body grip."
6. Breathe from the diaphragm in a manner rhythmic and sustained.

7. Walk with body in line with your leading foot.
8. Protect your body against weakness and ill health by muscular positiveness.
9. Sleep flat on your chest.
10. Bathe daily; eat simple food and take long walks.

Rules 3, 4, 5, 6, 7 and 8 can be practiced anywhere without embarrassment, as these can be performed in a moderate way that attracts no attention. Of course their efficiency is increased by more strenuous performance. For general purposes no such measures are necessary. With a little skill gained from practice, they can be performed imperceptibly.

Stretching

Stretching movements are performed by all animals. They aid the circulation, and re-establish nerve co-ordination. Animals delight in these movements after standing or lying for some time. Nothing will so effectively relieve congestion or contraction as persistent gentle stretching in every possible direction, if jerky movements are carefully avoided. The more relaxed the position, the better. Many a severe chill or painful inflammation can positively be greatly relieved, if not cured, in this manner alone. Nervousness will always yield to such treatment if systematically executed, as it is chiefly the result of constriction.

Spinal rotation

Spinal rotation will loosen the foramina (''spinal windows'') and will give resiliency to the intervertebral cartilage, maintain the vertebræ in their proper position and assure a normal condition of the nerves and blood-vessels of the spinal column. The lower half of the spine should be frequently rotated (as though there were a hinge in the small of the back), forward and backward without moving the shoulders. This part of the spine should also be moved in a circle. Then perform a similar movement with upper half of spine while lower half of the spine remains stationary, rotating shoulders in like manner. Each exercise may be varied by performing the movement in an opposite direction to that at first followed.

Carrying the weight of the body

Lift the weight of the body, both standing or sitting, and carry it suspended from the shoulders. The force of gravitation exerts a constant downward pull upon every part of one's body; unless guarded against, one unconsciously permits the body to literally slump and sag down.

To overcome this tendency, lift with the shoulders and stretch the muscles, first on one side of the body, then on the other, until you feel all the muscles lifting, then let loose of shoulders, holding the "body grip." Be careful to do so on deflated lungs; inflate only after you cease lifting. You must feel a sustaining muscular support, particularly under the shoulder blades. The shoulders themselves should be free from muscular tension. As an exercise, simply lift body upward with back muscles, first on one side and then on the other; next loosen shoulders, but maintain body in uplifted position. Inflate lungs afterwards. Never lift with the breath, as you can not hold the position. Take care not to lean backwards in lifting; throwing the shoulders far back is not an erect position.

Position of the neck

Hold your neck (not your head) in line with your spine, eyes lifted, chin always in. You must feel the pull in the muscles of the back of the neck and upper spine. No brain can be at its best with such pressure upon the nerves and blood-vessels. Pull your neck often in position with a side and upward movement of the head, but always chin in. Also sometimes pull head forward and down, to stretch the neck muscles.

The firm body grip

Brace yourself with a firm "body grip." Many men possess no weight or personality because of their loose, unstrung physical presence. A man of presence always stands with a solidity that compels our respect. His mind is in his body and his muscles are braced. His movements are steady and suggest power. The voice of a man with a "grip on himself" is firm, resonant and sustained. We feel his reserve power—he has himself in hand.

Breathe from the diaphragm

Rhythmic and sustained diaphragmatic breathing is much talked about, but not practiced. Most men are "gasping" instead of breathing while conversing. Inhaling through the nose is too slow for them, because they wait too long before the lungs are filled.

Diaphragmatic breathing is internal massage of the most efficient kind. Rhythmic breathing regulates the heart and gives self-control to the mind. Sustained breathing is natural economy of energy. Pauses should occur before and after each breath. The diaphragm is the piston of the human engine, and upon its perfect action depends efficiency and endurance.

Walking line for the body

Walk with body in line with leading foot. You may think you do, but a test will convince you to the contrary. Watch people as they pass you, and you will notice that each one throws the leading foot far ahead of the line of the body. The toes are turned up, the knees straightened and the foot strikes the ground with heel first.

Rules for correct walking are: (a) lift body well up and stand with weight upon the balls of your feet; (b) raise heel and bend knee of leading foot; (c) spring forward with free action, knee leading, foot in line with body, toe pointing down; (d) take a stride to suit the length of your legs; (e) walk without rocking the body; (f) walk with your legs and not with your hands. Swinging the arms, unnecessarily, is the remnant of primitive walking upon all-fours. Try this test: Stand erect in front of a wall about a foot away, step gently towards the wall. If you step correctly your forehead, knee and foot touch simultaneously. Practice until they do.

Muscular positiveness

Protect your body against weakness and ill health by muscular positiveness. The unprotected body is at the mercy of worry, jars and depressions. This muscular positiveness may be induced by pulling, jolting or pushing the negative body into resisting positiveness.

Sleeping posture

Sleep flat on your chest. The most natural and beneficial position for a sleeper is flat upon the chest. Spread out, use no high pillow, lying upon either side of face. This position straightens shoulders, induces lateral lung expansion and keeps the blood from the cerebellum, assuring dreamless sleep. Colic and stomach-ache are relieved in this natural position. Snoring, chills or head colds will disappear. Indians and animals never take the "back" position. It is in animals a sign of extreme helplessness or death when taking this position. Women can protect the breasts from injurious pressure by lifting them well up.

Bath and diet

Bathe daily, eat simple food and take long walks. The daily bath is one of the most necessary luxuries one can indulge in and one that repays well for the time it requires.—[*From "Physical Culture," by permission.*]

XXXV

CONDENSED RULES OF HEALTH

JENETTE H. BOLLES, M. D.
Chairman Child Hygiene Committee of the Colorado Branch of the N. C. M.

Ten essentials

1. Pure air.
2. Pure food.
3. Pure water.
4. Plenty of sleep.
5. Plenty of exercise.
6. Proper bathing.
7. Proper clothing.
8. Sanitary surroundings.
9. Proper attention to mechanical injuries.
10. Knowledge of the functions of the body.

How much and how often to eat

The normal adult requires in each 24 hours, 1 ounce of solid food for each 10 pounds of body weight.

Illustration: A person who weighs 120 pounds requires 12 ounces of solid food per day.

An adult requires 2 quarts of water per day, exclusive of the liquid taken at meals. The diet of a normal person should be a mixed diet containing fats, sugars and starches.

The digestion of one meal should be completed before another is begun.

Eliminations

The four organs of the body which throw off the waste matter are:

1. Skin.
2. Lungs.

3. Kidneys.
4. Bowels.

These organs eliminate poison.

This poison retained in the system is the cause of many ailments.

The skin may be kept active by rubbing and bathing.

The lungs may be kept active by plenty of exercise.

The kidneys may be kept active by drinking plenty of water.

The bowels may be kept active by daily care, including proper food and exercise.

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(A very useful small book in the form of a catechism, covering all departments of the subject.)

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(Printed by The Delineator for American mothers; its price is only 25 cents. It includes, also, brief pages on various children's diseases.)

Mother's Manual..............Emelyn Lincoln Coolidge
(Gives simple but complete directions for the care of the baby during each of its first twelve months.)

The Baby........................Daniel Rollins Brown
(Not a book of directions. It teaches principles. Nutritive values and the infantile powers of digestion are well covered.)

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(Concise and useful. Can be ordered from the National Congress of Mothers, Washington, D. C. 25 cents.)

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(Cover the whole question of milk and solid foods, and are free. Bulletins of State Departments of Health and Agriculture are free to those living in the state.)

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(A fifty-page brief on hygienic living and sensible thinking.)

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(A brief which aims to lessen, by early preventive measures, the ills of both childhood and adult life.)

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(A sort of encyclopaedia of the body and its environment in home and municipality. Inexpensive but very handy little book.)

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